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An exploration of the relationship between interpersonal trauma in childhood and wellbeing in the context of auditory hallucinations: testing for moderating effects of appraisals and coping.

Doctorate in Clinical Psychology

Emma Lidstone

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Name: Emma Lidstone

Supervisors: Dr Matthias Schwannauer and Dr Donna Paxton

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THESIS ABSTRACT

Background: The first aim of this thesis was to systematically review the evidence for the impact of interpersonal trauma in childhood on appraisals of auditory hallucinations in adulthood. Informed by this systematic review and cognitive models of psychosis, potential moderators of the relationship between trauma and distress were proposed.

Hypotheses: It was hypothesised that the experience of interpersonal trauma in childhood would predict 'self blaming' and 'danger to self' appraisals made by voice hearers about their auditory hallucinations. It was predicted that these appraisals would interact with the use of avoidant and non avoidant coping strategies and that this would predict wellbeing.

Method 1 and results: In order to measure voice appraisals, the Interpretation of Voices Inventory was adapted. It was completed by one hundred and thirteen voice hearing participants and confirmatory factor analysis was used to test the predicted factors. Most items covaried with their respective factors acceptably. A number of items did not load well and it was recommended that they be removed from the measure. The amended factor structure improved the fit of the measure to an acceptable standard.

Method 2 and results: Sixty two participants completed additional measures of interpersonal trauma in childhood and wellbeing. Structural equation modeling provided support for a link between severity of childhood trauma and 'danger to self' appraisals. 'Danger to self' appraisals predicted the use of acceptance based coping and this predicted wellbeing. Independent of this model, interpersonal coping was shown to predict the use of psychological explanations for the experience of auditory hallucinations. Psychological explanations did not predict acceptance or wellbeing.

Discussion: It may be clinically helpful to test acceptance based interventions using 'danger to self' appraisals as an outcome measure in the future. Possible factors that may have influenced the results were reflected on. The potentially negative impact of insight on wellbeing was discussed. Stigma was highlighted as a potential barrier to non avoidant coping

SUMMARY IN PLAIN ENGLISH

Research has shown that people who have experienced abuse in childhood sometimes struggle more if they start to hear voices. The idea behind this project was to see whether people who have experienced abusive relationships in childhood might be more likely to think self blaming thoughts about their voices like ‘it’s my fault’, ‘it’s something bad about me that’s caused them’. The project also predicted that people who have been abused in childhood might be more likely to feel scared by the voices and believe that the voices can do them serious damage.

Coping is an area that is very relevant to this question. Some people have shown (and I guess it makes common sense) that what you believe about hearing voices impacts on how you cope with them. The research seems to point to the idea that everybody is helped by different ways of coping and that coping in one way might suit one situation whereas coping in another way might be better for another. Some people think that too much avoidance can cause problems by making voices feel scarier. They think that if someone always tries to drown out the voices or ignore them, the fear of the voices talking becomes more and more anxiety provoking. They think that allowing yourself to hear the voices helps you get used to them and helps you test them out – to see what they are like and what they are capable of.

This project predicted that talking to other people about voices and accepting the experience of auditory hallucinations would relate to people’s wellbeing. The project wanted to test whether self blaming thoughts about hearing voices might stop some people from talking about them. The project also wanted to test whether feeling that voices can harm you might be linked with struggling to accept them. Finally the project predicted that coping by talking to people and accepting voice experiences might be linked to people’s belief that there is a psychological component to their voices.

The results showed that the number of types of abuse someone has experienced was linked to experiencing voices as dangerous. This sense of danger was associated with less acceptance of voices and poorer wellbeing. Acceptance was shown to be strongly linked to wellbeing. Talking to other people about voices was shown to be linked with ‘psychological’ explanations like ‘I’m tired’ and ‘I’m stressed’ and thinking of the voices as an illness. The study couldn’t show whether these explanations were a help or a hindrance to wellbeing. Participant comments drew attention to the barriers associated with stigma that people face. This was highlighted as a factor that could limit the coping strategies people use.

SYSTEMATIC REVIEW

The impact of interpersonal trauma in childhood on beliefs about voices.

Emma Lidstone^a & Matthias Schwannauer^b

^a Child and Adolescent Mental Health Services, Andrew Lang Unit, Viewfield Lane, Selkirk TD7 4LJ

^b Department of Clinical Psychology, University of Edinburgh, Teviot Place EH8 9AG

Corresponding author: Emma Lidstone
Tel: 01750 23715
Fax: 01750 725116

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Abstract

Background: Cognitive models have been used increasingly to conceptualise people's experiences of auditory hallucinations. A link between childhood traumatic events and psychotic disorders has also been increasingly discussed.

Aims: The aim of this article was to systematically review academic studies that tested for an association between childhood interpersonal trauma and appraisals of auditory hallucinations.

Results: A total of ten studies were identified. Seven studies used clinical samples and three used non clinical samples. Different definitions and measures were used by the studies and the reported strength of the relationship between trauma and appraisals varied. Appraisals predicted distress to some degree for all the studies that tested for it. The relationship appeared to be moderated by other factors.

Conclusion: A small number of studies provided evidence for an effect of various measures of trauma on appraisals. Although significant relationships were reported, predicted relationships, such as negative beliefs about self and self blame, were also reported to be non significant. There were no studies that evaluated the effect of interpersonal trauma in childhood as a distinct category; most studies used total scores of trauma. Studies used small, specially selected samples that may not be representative of voice hearers in the general population.

Introduction

Poorer outcomes have been described for individuals with trauma histories and psychosis compared with counterparts who have not been exposed to traumatic events. More severe depression, anxiety, suicidality and substance use have been described, in addition to poorer engagement with services and adherence to treatments (Bendall, Jackson, Hulbert & McGorry, 2010).

It has been suggested that positive symptoms may in fact be variants of, or on a continuum with, intrusive post traumatic symptoms. Similarities in their presentation to flashbacks, nightmares and dissociation have been used to support this idea. Also, studies have found that the content of hallucinations and delusions experienced by abuse survivors is frequently related to the abuse they experienced (Morrison, Frame & Larkin, 2003).

Others have suggested a less direct relationship between trauma and auditory hallucinations. It is thought that childhood maltreatment may lead to a predisposition to the experience and maintenance of psychotic symptoms via biological, psychological and social pathways. Examples of these pathways include genetic factors, heightened stress responses, difficulties differentiating internal and external stimuli, problematic thinking styles, negative schemas and interpersonal patterns of subordination (Read, Fink, Rudegeair, Felitti & Whitfield., 2008).

Schafer *et al.* (2012) highlighted results from a small number of studies that when pulled together indicated substantial variability in levels of dissociative symptoms among psychotic patients. For example, Schafer *et al.*, (2006) assessed patients with schizophrenia spectrum disorders at two stages. They found a significant decrease in scores for dissociative symptoms from admission to stabilisation several weeks later. At admission, significant correlations between dissociative symptoms and the Childhood Trauma Questionnaire (CTQ) 'emotional abuse' and 'physical neglect' subscales were observed. Only 'emotional abuse' remained significant once patients were stabilised. In light of these findings, Schafer *et al.* (2012) suggested that psychotic symptoms may mediate the relationship between trauma and dissociation in patients with schizophrenia. However, they also highlighted an important methodological consideration. Because there can be such overlap in content, differentiating psychotic and dissociative phenomena is very difficult. In some cases, heightened dissociation scores could have been generated by increased psychotic symptoms.

High prevalence rates for non clinical auditory hallucinations and other unusual experiences have been reported among general populations. This has given rise to continuum models (van Os, Linscott, Myin-Germeys, Delespaul & Krabbendam, 2009) that suggest a benefit associated with identifying factors that differentiate clinical and non clinical status. For example, although with a small sample of ten, Bak *et al.* (2005) showed that adults who had been abused as children were ten times more likely to experience distress on first experiencing psychotic symptoms than adults who had not been abused as children.

Models of distress in relation to auditory hallucinations

The cognitive model of auditory hallucinations suggests that a person's emotional and behavioural reaction to hearing voices is strongly related to their appraisal of them. Mawson, Cohen and Berry (2010) identified 26 studies published between 1990 and 2008 that tested this proposed link between voice appraisals and distress. Most of the studies measured distress by quantifying depression symptoms. Perceived voice supremacy or dominance was the type of voice appraisal that was most measured, followed by perceived malevolence. Mawson *et al.* observed that voice supremacy and malevolence predicted distress consistently when measures took account of how participants experienced their voices rather than content and topography only. Mawson *et al.* reported a smaller number of studies that measured benevolence, voice acquaintance and acceptance; relationships between these factors and distress appeared to be less conclusive.

The post traumatic stress disorder (PTSD) literature has similarly explored the impact of appraisals on distress. Sherrer (2011) reviewed nine studies examining the link between appraisals of traumatic events and post traumatic adaptation in people with serious mental illness. Five studies reported links between trauma related negative beliefs about self and others with adverse outcomes and increased PTSD symptoms. Two studies made these same links with guilt cognitions, believing the persecution to be deserved, appraisals of helplessness and loss of control.

Honig *et al.* (1998) illustrated the symptomological overlap between psychosis and PTSD by interviewing different groups of voice hearers about their experiences. They found that 100% of participants diagnosed with schizophrenia and 93% of participants diagnosed with dissociative disorders reported hearing negative voices compared with 53% of non clinical voice hearers who reported hearing predominantly positive voices. The clinical groups both reported hearing voices that commented on their own thoughts and their thoughts about others more than the non clinical group. The form of the voice appeared to be similar for all

three groups but the clinical groups were more likely to hear voices daily and continuously. Interestingly, the only difference between schizophrenia related and dissociative voice hearing was that the schizophrenic participants heard their voices talking about them in the third person more.

When Ross, Anderson and Clark (1994) interviewed 83 patients with schizophrenia, they found that the symptom with the strongest link to childhood abuse was commenting voices. In order of strength of relationship with abuse, ideas of reference, thought insertion, paranoid ideation, reading minds and visual hallucinations were also significant.

Ross and Norton (1998) calculated an average of 4.9 Schneiderian symptoms (delusion of control, thought broadcasting, thought withdrawal, thought insertion, commenting voices, and auditory hallucinations involving two voices having a conversation) in 368 participants diagnosed with multiple personality disorder (MPD). They compared this with an average of 1.3 symptoms acknowledged by 1,739 participants diagnosed with schizophrenia from other published studies. They concluded that Schneiderian symptoms appeared to be more characteristic of MPD than of schizophrenia.

Ross (2008) highlighted that difficulties associated with defining and differentiating dissociation and schizophrenia limit the validity of results generated by research in both fields. Moskowitz (2011) reports that the DSM-V schizophrenia committee has recommended the elimination of the first rank Schneiderian symptoms because they have no unique diagnostic specificity for schizophrenia. Moskowitz questions whether this is indicative of a paradigm shift where diagnostically the overlap between these areas will be made more explicit.

Methodological considerations

When considering results it should be remembered that most of the studies exploring beliefs about voices and trauma have used small groups of participants who have been involved with services and have been specially selected by clinicians or have volunteered themselves for participation. This of course means that our understanding, to a great extent, is based on a small and specific subsection of the greater population of individuals suffering from schizophrenia or psychosis (Mawson *et al.*, 2010). It has also been commented that reporting of childhood abuse is unreliable and that results are skewed by variations in the contexts and methods used to obtain disclosures. The limited number of longitudinal studies

limits the scope for addressing issues of causality between factors and makes biases associated with retrospective reporting an issue (McCarthy Jones, 2011). Contrary to this, Fisher *et al.* (2011) showed that patient disclosures correlated with clinical case notes, were stable over a 7 year period and were not affected by changes in mental health.

Present study

The purpose of the present study was to search for and review studies that explored the relationship between interpersonal trauma in childhood and voice appraisals in adulthood. In light of the literature discussed, it was hypothesised that studies would report an association between interpersonal and perceived voice supremacy and malevolence.

Method

The following databases were used to search for abstracts on 13/04/2012.

The following search terms were used:

- psychosis or psychotic or schizophren*
- subject headings were used when possible (psychosis and schizophrenia)
- voice* or hallucinat*
- belief* or believ* or attribut* or interpret* or apprais* or evaluat* or cognit* or metacognit*
- 'child*' or 'trauma' or 'abuse' or 'sexual' or 'physical' or 'neglect' or 'emotional'

No additional limitations were applied to the searches.

After deduplication within each search engine (electronic deduplication between search engines was not possible), a total of 174 journal articles were considered as potentially relevant for the review. These were generated by the following search engines:

- OVID searching PsychInfo, Embase and Medline = 92
- Web of Knowledge = 76
- EBSCOHost searching Academic Search Elite and CINAHL Plus = 6

Abstracts from the 174 articles were reviewed manually, using the following inclusion criteria:

- Did the article measure childhood interpersonal trauma in some way?
- Did the article measure participants' voice appraisals in some way?

(Including beliefs directly about voices and beliefs about self or others in the context of hearing voices.)

A hierarchical exclusion process was used to review the abstracts. Articles were ascribed the lowest exclusion category possible. This ensured greater consistency in the categorisation of the rejected articles. It also meant that trends in the literature could be observed more reliably. Details of the reasons for the exclusion of articles are provided in Table 1. The initial exclusion process highlighted 30 articles out of 174 as possible candidates for the review. These were then read by the author in full. Details of the reasons for the exclusion of articles after reading them in full are provided in Table 2. This process resulted in the exclusion of 20 articles and the final inclusion of 10.

Table 1: Exclusion categories used when reading abstracts

Category	Number of studies
Accepted as possibility	30
Reviews of literature	12
Theoretical papers	6
No abstract available	4
Study of schizophrenia outcomes related to childhood trauma without appraisals	11
No measure of appraisals of voices	39
No measure of childhood trauma	33
Physiological studies	17
Non psychosis/schizophrenia related studies	22

Table 2: Exclusion categories used when reading full articles

Category	Number of studies
Accepted for review	10
Duplicates (identical copies of the same article)	13
Case study	1
Studies of delusions only	4
Study of schizophrenia outcomes related to childhood trauma without appraisals	2

Results

References for the ten articles that met the inclusion criteria for the review are presented in Appendix A. Table A1 contains the references for the studies that used clinical participants; Table A2 contains the references for the studies that used non clinical participants. Clinical status was only attributed to samples that were in contact with mental health services for reasons associated with voice hearing or samples with schizophrenia spectrum diagnoses.

Clinical studies

Methodologies

Six studies identified as fitting the inclusion criteria utilised a clinical sample. Four of these studies used a cross sectional design with clinical participants and conducted analyses on the sample as a whole. Two studies implemented a between groups design and compared clinical participants with non clinical participants. Both of these studies recruited their non clinical participants from spiritualist and psychic institutions. One of these studies also advertised at a university for participants who reported unusual experiences.

The number of clinical participants that took part in the six studies ranged from 22 to 75. All participants were recruited via mental health services. Three studies recruited via community services. Two studies used a mixed sample of inpatients and outpatients. One study did not describe the type of mental health service they recruited from.

Four studies used a DSM-IV diagnosis of a schizophrenia related disorder to identify potential participants. One study used the ICD-10 diagnosis for non affective psychotic disorder. One study used participant reports of hearing voices only. Most studies did not apply explicit exclusion criteria. Two studies excluded cases where organic factors and substance use may have contributed to the participants' experiences.

The experience of childhood interpersonal trauma was quantified using different assessment tools; there was a little overlap between studies. Four studies used interviews and two studies used self report measures to gain disclosures. Of the studies that used interviews, three used the Trauma History Questionnaire as an interview (THQ; Green, 1996) and one used a simple childhood sexual abuse question as part of a wider clinical interview. Of the studies used self report questionnaires, one used the Impact of Events Scale (IES; Horowitz, Wilner & Alvarez, 1979) and the Post traumatic Diagnostic Scale (PDS; Foa, 1995). Another used the Parental Bonding Instrument (PBI; Parker, Tupling & Brown, 1979).

Although studies used different self report trauma measures, they generally quantified the number and degree of traumatic experiences or the extent of post traumatic symptoms. The only different measure that was used was the PBI that measured memories of maternal and paternal care and overprotection.

When measuring voice beliefs or appraisals, three studies used versions of the Beliefs about Voices Questionnaire (BAVQ; Chadwick & Birchwood, 1995 and BAVQ-R; Chadwick, Lees & Birchwood, 2000). One study used the Post Traumatic Cognitions Inventory (PTCI; Foa *et al.*, 1999). Only two studies measured voice appraisals by interview. One study used the Appraisals of Anomalous Experiences interview (AANEX; Brett *et al.*, 2007) and the other used the Psychotic Symptoms Rating Scale (PSYRATS; Haddock, McCarron, Tarrier & Faragher, 1999). The BAVQ was used to measure perceived malevolence, benevolence and omnipotence of voices. The PTCI was used to measure negative cognitions about self, negative cognitions about the world and self blame associated with traumatic events and resulting symptoms. The AANEX-CAR (a subsection of the AANEX) was used to measure spiritual, normalising/psychological, medical and ‘caused by other people’ appraisals. The PSYRATS was used to gain descriptions of participant beliefs about their experiences; these were coded into themes by the researchers.

Results

Lovatt, Mason, Brett and Peters (2010) reported that their clinical sample was more likely to appraise unusual experiences (which included hearing voices) as being caused by other people. Their nonclinical sample was more likely to make normalising/psychological appraisals of their experiences. This effect remained significant after types of experience were controlled for. There were also differences between the groups in the number of positive appraisals they reported, the number of externalising appraisals and the attribution of their experiences to an agency personally targeting them, rather than an impersonal cause. In addition to these significant effects, Lovatt *et al.* reported a trend with the clinical group being more likely to appraise their experiences as dangerous. Group status was not related to spiritual or medical appraisals.

88% of clinical and 92.6% of non clinical respondents reported experiencing interpersonal trauma at some point in their lives. Using a series of regressions, interpersonal trauma (during lifetime) was shown to predict appraisals of experiences being caused by other people and fewer normalising / psychological appraisals. It did not predict spiritual or

medical appraisals. Impersonal and stressful traumatic experiences did not predict any appraisal type.

Significantly more participants from Andrew, Gray and Snowden's (2008) clinical sample reported experiencing sexual abuse than their non clinical sample (50% versus 14%). Their clinical sample also reported having been exposed to significantly more types of trauma in their lifetime. This effect ceased to be significant when total types of trauma were separated into experiences during childhood and experiences during adulthood.

They reported that their clinical sample experienced voices as more malevolent and omnipotent than the non clinical group. Their non clinical sample experienced their voices as more benevolent and they engaged more with their voices. The total score from the Impact of Events Scale by linear regression was the only significant predictor of perceived malevolence, benevolence and omnipotence. When the total score was broken down into subscales (including childhood sexual abuse), the effect lost significance. The number of traumatic events and history of sexual assault in childhood were not significant predictors. The only significant predictor of distress as measured by the Beck Depression Inventory-II (BDI-II; Beck, Steer & Brown, 1996) was voice malevolence. The only significant predictor of distress as measured by the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer, 1988) was total trauma score.

Kilcommons and Morrison (2005) used the PTCI to measure trauma related thoughts and beliefs within their sample of people diagnosed with schizophrenia spectrum disorders. The overall rate of trauma exposure was high (94%). Despite only one participant having received a formal diagnosis of PTSD, 53% met DSM-IV PTSD criteria. Kilcommons and Morrison did not test a direct relationship between trauma and appraisals but reported significant correlations between trauma related negative cognitions about self and the world and the experience of hallucinations. These negative cognitions only correlated with the experience of hallucinations and did not correlate with delusions or overall score for positive psychotic symptoms.

Fifty five percent of Hardy *et al.*'s (2005) clinical sample identified that they continued to be 'affected' by a traumatic event from the past. Hardy *et al.* only included traumatic events that participants said continued to affect their day to day life in their analyses. Just over half of these participants had at least one type of phenomenological association between their

traumas and hallucinations. Hardy *et al.* rated the content of participants' accounts of traumatic experiences and hallucinations on the themes of humiliation, intrusiveness, threat and guilt. Using chi square analysis, they reported that the themes of humiliation, threat and guilt did not differentiate participants who were and were not experiencing hallucinations related to the same theme. They did observe, however, that participants who had experienced an intrusive trauma were significantly more likely to experience intrusive hallucinations.

Offen, Waller and Thomas (2003a) compared participants with psychotic disorders who did and did not report childhood sexual abuse on a number of measures. They found that as expected, the sexually abused group reported significantly higher levels of dissociation and depression. This group also reported increased scores on perceived malevolence but this effect was reported as non significant (at the $p=0.052$ level). There were no group differences on perceived voice benevolence, resistance, engagement or power.

Offen, Waller and Thomas (2003b) used preliminary correlations to show that recalled parenting was associated with dissociation, depression and beliefs about voices being malevolent. They then used exploratory regression analyses to identify that paternal overprotection predicted perceived malevolence of voices. This effect was not replicated with any of the other measures of recalled parenting (maternal overprotection, maternal care and paternal care). Despite there not being a specific measure of trauma in this study, it was felt that remembered parenting was relevant enough to be included in the review.

Offen *et al.* (2003a) and Offen *et al.* (2003b) used the BDI to measure depression. Neither of these articles reported a direct relationship between appraisals and distress. However, they both observed that depression and malevolent appraisals were predicted by the same variables. Offen *et al.* (2003a) reported significant negative correlations of age at first abuse with the belief that voices were malevolent and depression scores. Offen *et al.* (2003b) reported both the prediction of depression and malevolence by paternal overprotection at trend level.

Details of the significant relationships between trauma and appraisals reported by each study (and the statistical methods used) are presented in Table 3. Details of the significant relationships between appraisals and distress reported by each study (and the statistical methods used) are presented in Table 4.

Table 3: Reported significant relationships between trauma and voice appraisals

Authors	Study design	Participants	Trauma	Appraisals	Trauma measure	Appraisal measure	Statistic used
Lovatt <i>et al.</i> (2010)	Between groups	Clinical sample = 27 Non clinical sample = 27	Interpersonal trauma (in lifetime)	Other people Normalising / Psychological	(THQ; Green, 1996)	(AANEX; Brett et al., 2007)	Regression
Andrew <i>et al.</i> (2008)	Between groups	Clinical sample = 22 Non clinical sample = 21	Trauma total	Malevolence Benevolence Omnipotence	(PDS; Foa, 1995)	(BAVQ-R; Chadwick et al. 2000)	Regression
Hardy <i>et al.</i> (2005)	Cross sectional	Whole sample (clinical) = 75	Intrusive trauma in lifetime	Intrusiveness	(THQ; Green, 1996)	(PSYRATS; Haddock <i>et al.</i> , 1999) Coding system designed by authors used on responses	Chi square
Offen <i>et al.</i> (2003a)	Cross sectional	Whole sample (clinical) = 36	Childhood sexual abuse Older age when abuse started	Malevolence (p=0.052) Malevolence	Sexual abuse item within clinical Interview	(BAVQ, Chadwick & Birchwood, 1995)	Mann-Whitney Correlation
Offen <i>et al.</i> (2003b)	Cross sectional	Whole sample (clinical) = 26	Paternal overprotection in childhood	Malevolence	(PBI; Parker, <i>et al.</i> , 1979)	(BAVQ, Chadwick & Birchwood, 1995)	Regression

Table 4: Reported significant relationships between appraisals and distress

Authors	Study design	Participants	Appraisals	Distress	Appraisal measure	Distress measure	Statistic used
Lovatt <i>et al.</i> (2010)	Between groups	Clinical sample = 27 Non clinical sample = 27	Other people Normalising / Psychological Valence Externalising Personalising	Clinical status	(AANEX; Brett <i>et al.</i> , 2007)	Group status	Regression
Andrew <i>et al.</i> (2008)	Between groups	Clinical sample = 22 Non clinical sample = 21	Malevolence	Depression	(PDS; Foa, 1995)	(BDI-II; Beck <i>et al.</i> , 1996)	Regression
Kilcommons & Morrison (2005)	Cross sectional	Whole sample (clinical) = 32	Negative beliefs about self Negative beliefs about the world	Experience of hallucinations	(PTCI; Foa <i>et al.</i> , 1999)	None	Correlations

Non clinical studies

Methodologies

In addition to the six clinical studies, four studies used participants who had not received any diagnosis or clinical input relating to hearing voices. All four studies measured participant predisposition to hallucinations using either the Launay Slade Hallucinations Scale (LSHS; Launay & Slade, 1981) or its adapted version, the Revised Hallucinations Scale (RHS; Morrison et al., 2000). The LSHS a 12-item measure of predisposition toward auditory and visual hallucinations, It was adapted by Morrison et al. to incorporate four additional items measuring predisposition to visual hallucination and to make use of a four point scale instead of a true/false option.

Three studies used larger sample sizes (ranging from 62 to 373 participants) and recruited school pupils, university students and warehouse staff. One study used a between groups design with 40 participants in each group. They compared participants recruited via psychological trauma services and university students. No exclusion criteria were documented by the larger scale studies.

All four studies measured trauma using self report measures, each of them defined trauma differently. Kilcommons, Morrison, Knight and Lobban (2008) used the Sexual Events Questionnaire II (SEQ-II; Calam & Slade, 1989) to allocate participants to their groups. Campbell and Morrison (2007) used the Bully/Victim Questionnaire (BVQ; Olweus, 1996) to measure participants' experiences of being victimised. Gracie *et al.* (2007) used the Traumatic Life Events Questionnaire (TLEQ; Kubany *et al.*, 2000) to quantify exposure within a participant's life time and Morrison and Petersen (2003) designed an interpersonal trauma questionnaire for their own use.

The studies also measured appraisals differently. Naturally the appraisals that were measured by these studies were less directly related to hallucinations than the appraisals measured by the clinical studies. All of the studies used self report measures. Two studies used the Post Traumatic Cognitions Inventory. Gracie *et al.* used the Brief Core Schema Scale (Fowler *et al.*, 2006) to measure four constructs: positive self, negative self, positive other, and negative other. Morrison and Petersen used the Post Traumatic Cognitions Inventory, a measure of metacognitive beliefs (Metacognitions Questionnaire; Cartwright-Hatton & Wells, 1997) and the Interpretation of Voices Inventory (IVI; Morrison, Wells &

Northard, 2002). The IVI measures appraisals of hypothetical auditory hallucinations and does not require a participant to have experienced them in order to complete the measure.

Results

Of Kilcommons *et al.*'s (2008) sexually abused participants, 90% endorsed at least one item on the predisposition to hallucinations subscale. Of these participants, 46 % either had experienced auditory hallucinations in the past or were experiencing them at the time of participation (as measured by the Auditory Hallucinations Rating Scale (AHRS; Haddock, 1994)). They did not test the relationship between sexual trauma and appraisals directly but did report that negative appraisals about the self and the world were associated with predisposition to visual hallucinations, auditory hallucinations and delusions. They also reported a dose response relationship; that severity of sexual trauma (as defined by the number of events) was associated with severity of psychotic experiences.

Campbell and Morrison (2007) recruited 14 to 16 year old school children to complete questionnaires about their experiences of bullying. Those who reported bullying completed the PTCI in relation to their experiences. Those who did not identify any bullying completed the PTCI about the most traumatic experience they had been exposed to in their lifetime. As with Kilcommons *et al.*, they did not test for a link between trauma and appraisals. Instead they reported associations between trauma related negative beliefs and predisposition to auditory hallucinations. Negative beliefs about self and the world separately predicted predisposition to auditory hallucinations. Self blame, however, did not.

Gracie *et al.* (2007) recruited undergraduate students who completed online measures of traumatic life events, PTSD, schematic beliefs, perceptual anomalies and predisposition to hallucinations and paranoia. As with Kilcommons *et al.* and Campbell and Morrison, they did not test for an association between trauma and beliefs. As with Kilcommons *et al.* and Campbell and Morrison, they tested for an association between trauma related negative beliefs about self and others and a predisposition to auditory hallucinations. They reported that PTSD re-experiencing symptoms and trauma related negative beliefs about others predicted predisposition to auditory hallucinations. Negative beliefs about self, however, did not.

Unlike the other studies, Morrison and Petersen (2003) measured participant exposure to a range of interpersonal traumas. They reported that predisposition to auditory hallucinations

was significantly greater for participants who reported multiple trauma compared to single trauma. They also reported that emotional abuse was the only type of trauma that predicted predisposition to auditory hallucinations. Like the other studies using non clinical populations, Morrison and Petersen did not test the relationship between trauma and appraisals explicitly. They found that trauma related negative cognitions about self and self blame were not associated with the predisposition to auditory hallucinations. Using a regression, they reported that positive beliefs about voices did not predict predisposition either. They did report, however, that trauma related negative cognitions about the world were significantly associated with predisposition to auditory hallucinations.

Details of the significant relationships between trauma and appraisals reported by each study (and the statistical methods used) are presented in Table 5. Details of the significant relationships between appraisals and distress reported by each study (and the statistical methods used) are presented in Table 6.

Table 5: Reported significant relationships between trauma and voice appraisals

Authors	Study design	Participants	Trauma	Appraisals	Trauma measure	Appraisal measure	Statistic used
Kilcommons <i>et al.</i> (2008)	Between groups	Clinical sample = 40 Non clinical sample = 40	Sexual assault / abuse in lifetime	Negative beliefs about self and world	(SEQ-II; Calam & Slade, 1989)	(PTCI; Foa <i>et al.</i> 1999)	Not tested
Campbell & Morrison (2007)	Cross sectional	Whole sample (nonclinical) =373	Bullying / victimization	Negative beliefs about self Negative beliefs about world Self blame	(BVQ; Olweus, 1996)	(PTCI; Foa <i>et al.</i> 1999)	Not tested
Gracie <i>et al.</i> (2007)	Cross sectional	Whole sample (nonclinical) =228	Traumatic life events	Negative beliefs about self Negative beliefs about world	(TLEQ; Kubany <i>et al.</i> , 2000)	(PTCI; Foa <i>et al.</i> 1999)	Not tested
Morrison & Petersen (2003)	Cross sectional	Whole sample (nonclinical) =64	Interpersonal trauma in lifetime	Negative beliefs about self Negative beliefs about world Self blame Positive beliefs about voices	Interpersonal trauma measure designed by authors	(PTCI; Foa <i>et al.</i> 1999) (IVI; Morrison <i>et al.</i> , 2002)	Not tested

Table 6: Reported significant relationships between appraisals and distress

Authors	Study design	Participants	Appraisals	Significant Distress	Appraisal measure	Distress measure	Statistic
Kilcommons <i>et al.</i> (2008)	Between groups	Clinical sample = 40 Non clinical sample = 40	Negative beliefs about self and world	Predisposition to auditory hallucinations	(PTCI; Foa <i>et al.</i> 1999)	(RHS; Morrison <i>et al.</i> , 2002)	Correlation
Campbell & Morrison (2007)	Cross sectional	Whole sample (nonclinical) =373	Negative beliefs about self Negative beliefs about world Self blame Negative beliefs about self Negative beliefs about world	Predisposition to psychotic phenomena Predisposition to auditory hallucinations	(PTCI; Foa <i>et al.</i> 1999)	(RHS; Morrison <i>et al.</i> , 2002)	Correlation Regression
Gracie <i>et al.</i> (2007)	Cross sectional	Whole sample (nonclinical) =228	Negative beliefs about the world	Predisposition to auditory hallucinations	(PTCI; Foa <i>et al.</i> 1999)	(LSHS; Bentall & Slade, 1985)	Regression
Morrison & Petersen (2003)	Cross sectional	Whole sample (nonclinical) =64	Negative beliefs about the world	Predisposition to auditory hallucinations	(PTCI; Foa <i>et al.</i> 1999)	(RHS; Morrison <i>et al.</i> , 2002)	Correlation

Discussion

Trauma measures

Of the ten articles that were reviewed, five tested for and reported some degree of evidence for a relationship between trauma and appraisals using a clinical sample. Four studies tested for and reported some level of evidence for a link between trauma related beliefs and the experience of auditory hallucinations among non clinical participants. All of these studies measured interpersonal trauma in childhood in some way; however, they all subsumed it within another score.

Appraisal measures

By far the most common appraisals measured among the studies that used clinical samples were those measured by the BAVQ and BAVQ-R. Lovatt, Mason, Brett and Peters (2010) used the AANEX interview to score people's explanations of their experiences on how much they endorsed 'other people', normalising/psychological, valence, externalising and personalising appraisals. Hardy *et al.* used the PSYRATS interview to gain participant accounts of their unusual experiences and coded them thematically on intrusion, humiliation, threat and guilt. All four studies that used non clinical samples measured negative beliefs about self and negative beliefs about the world. The limited range of appraisals measured by the studies suggests a limited availability of appraisal measures.

Trauma rates

There was variation in the reported types and rates of trauma experienced by the samples from the studies. Lovatt *et al.* (2010) reported higher rates of lifetime interpersonal trauma in their non clinical sample (92.6%) than their clinical sample (88%). On the other hand, Andrew *et al.* (2008) reported more lifetime sexual abuse in their clinical sample (50%) than their non clinical sample (14%) reporting anomalous experiences.

Kilcommons and Morrison (2005) only used a clinical sample and reported a high rate of lifetime trauma (94%). Hardy *et al.* only used a clinical sample and reported rates for lifetime bullying (30%), sexual abuse in adulthood (20%) and sexual abuse in childhood (17.5%). Offen, Waller and Thomas (2003b) reported a rate for lifetime sexual abuse of 38.5% in their clinical sample.

It is unsurprising that the highest rates of trauma among clinical samples were given for lifetime interpersonal trauma and lifetime general trauma. These rates were comparable and

noticeably greater than the rates that were given for sexual abuse and bullying. Measuring interpersonal trauma as an entity may be more effective than isolating individual subtypes.

With the exception of Lovatt *et al.*, none of the studies using clinical samples measured interpersonal trauma distinctly. Lovatt *et al.*'s higher rate of interpersonal trauma among their non clinical sample supports the idea that any effect of interpersonal trauma on distress is not direct but mediated by other factors.

Results

Malevolence was reported as being associated with or predicted by trauma more than any other appraisal. Of all the studies that tested for a relationship between trauma and perceived malevolence, non significant results were never reported. Perceived malevolence was shown to be associated with total trauma scores, lifetime interpersonal trauma, trauma categorised as intrusive, sexual abuse in childhood and paternal overprotection.

In addition to the link between trauma and perceived malevolence, Andrews *et al.* reported significant links between total trauma with benevolence and omnipotence. Similarly, Offen *et al.* (2003a) tested for links between sexual abuse and perceived benevolence and omnipotence; but these were found to be non significant. Interpersonal trauma in lifetime was linked by Lovatt *et al.* with 'caused by other people' and normalising/psychological appraisals.

Trauma related negative beliefs about the world significantly predicted or correlated with a predisposition to auditory hallucinations. This was reported by all three of the studies that tested for it. Kilcommons *et al.* combined negative beliefs about others with negative beliefs about self. This was also reported to be significantly associated with predisposition to auditory hallucinations. These studies linked negative beliefs about the world with lifetime experiences of sexual assault/abuse, bullying/victimization, traumatic life events and interpersonal trauma.

Negative beliefs about self were shown to independently predict predisposition to auditory hallucinations by Campbell and Morrison in the context of bullying/victimisation. As mentioned, Kilcommons *et al.* reported a significant effect for the combined beliefs about self and others in the context of sexual abuse/assault. Gracie *et al.* and Morrison and Petersen did not replicate these results in the context of lifetime experience of traumatic events and interpersonal trauma.

From the results from these studies, trauma appeared to predict perceived malevolence and negative beliefs about the world most consistently.

Link to distress

Discounting the studies that used the experience of hallucinations as a measure of distress, only two studies tested for and reported a link between appraisals and distress. Lovatt *et al.* reported a number of voice appraisals (other people, normalising/psychological, valence, externalising, personalising) that differentiated between their clinical and non clinical participants. Andrew *et al.* reported that voice malevolence predicted distress as measured by the BDI-II. The only significant predictor of distress as measured by the BAI was total trauma score.

Dose response

Kilcommons *et al.* reported that severity of sexual trauma was associated with severity of psychotic experiences. Morrison and Petersen (2003) measured a range of interpersonal traumas. They reported that predisposition to auditory hallucinations was significantly greater for participants who reported multiple types of trauma compared to single trauma.

Potential moderation effects

55% of Hardy *et al.*'s (2005) clinical sample identified that they continued to be 'affected' by a traumatic event from the past. Kilcommons and Morrison reported that 53% of their clinical sample met DSM-IV PTSD criteria.

Andrew *et al.* reported that current trauma symptoms were found to be a significant predictor of beliefs about the malevolence, benevolence and omnipotence of the voices. This suggested that the extent to which the psychological effects of the trauma persist may be a particularly important factor in determining beliefs about voices.

Offen *et al.* (2003a) and Offen *et al.* (2003b) used the BDI to measure depression. Neither of these articles reported a direct relationship between appraisals and distress. However, they both observed that depression and malevolent appraisals were predicted by the same variables. Offen *et al.* (2003a) reported significant negative correlations of age at first abuse with the belief that voices were malevolent and depression scores. Offen *et al.* (2003b) reported both the prediction of depression and malevolence by paternal overprotection at trend level.

Measures of psychosis proneness

All four of the non clinical studies used the Launay Slade and the Revised Hallucinations Scale. The LSHS and the RHS represent the most common approach to measuring psychosis proneness. These measures have been criticised for using only positive symptoms of schizophrenia to inform their design. It has been argued that the use of these measures highlights a small group of high scorers (about 10% of the general population) but that it does not generate results in keeping with the hypothesised continuum for psychosis proneness. Claridge (1997) proposed that broader models that incorporate personality traits generate measures that are more useable in non-clinical populations due to their increased sensitivity.

Mason *et al.* (1995) for example used a broader, personality or trait based conceptualisation of psychosis proneness to generate their O-Life measure. They combined items from the Launay Slade Scale and a measure of delusions with items from a number of personality measures. Factor analysis using the data from this broader range of items generated four subscales. Each of the subscales has demonstrated good psychometric properties: *Unusual Experiences* (perceptual and hallucinatory experiences and magical thinking); *Cognitive Disorganisation* (difficulties with attention, concentration and decision-making together with a sense of purposelessness, moodiness and social anxiety); *Introverted Anhedonia* (lack of enjoyment from social sources as well as a range of other activities, dislike of emotional and physical intimacy and an emphasis on independence and solitude) and *Impulsive Nonconformity* (violent, self-abusive and reckless behaviours). Mason *et al.* advocated keeping the scores for each of the factors separate and did not consider them as subscales that contributed to a singular dimension.

In a more recent study, Barrantes-Vidal, Ros-Morente and Kwapil (2009) showed that neuroticism predicted psychotic like experiences, schizotypal and paranoid personality disorder symptoms, depressive episodes, and poorer adjustment, better than both positive and negative schizotypy. Neuroticism was also shown to moderate the relationship between positive schizotypy and interview measures of psychopathology and functioning. These findings are consistent with three large population studies of psychosis risk factors. All three of these studies highlighted the role of neuroticism as a risk factor for the development of psychosis in individuals with no previous history (Goodwin *et al.*, 2003; Krabbendam *et al.*, 2002; van Os and Jones, 2001).

This finding fits well the use of anxiety models to predict psychosis related distress. Wells and Matthews' (1994) self-referent executive function (S-REF) model, for example, has been used alongside two factor models of fear and avoidance (Mowrer, 1939; Clark, 1986) to propose mechanisms of distress maintenance in relation to psychotic experiences.

Limitations

As identified by McCarthy Jones (2011), the limited number of longitudinal studies limits the scope for addressing issues of causality between these factors and makes biases associated with retrospective reporting an issue.

An often heard criticism of population based trauma studies is the focus on the outcome of individual psychotic symptoms rather than a diagnosis of clinical psychotic disorder (Morgan & Fisher, 2007). The results from this study support this criticism and highlight a need for larger scale clinical studies. It should also be highlighted that the general population studies varied significantly in the way that they measured appraisals. This made it difficult to compare the results from the two groups of studies. Also, these studies are only relevant to the question posed by the review if a continuum model for the experience of auditory hallucinations is endorsed.

Conclusions

The results from the studies supported the proposition that there is a relationship between the experience of interpersonal trauma in childhood and voice appraisals. Unfortunately, this review did not generate any evidence for the effect of childhood interpersonal trauma as a category in its own right. However, a small number of studies did report significant results for subtypes of interpersonal trauma in childhood. These were childhood sexual abuse, paternal overprotection and bullying/victimisation.

Future directions

Because most of the articles identified by the review used childhood trauma scores to contribute to a total or overall trauma score that also included trauma in adulthood, the review in effect has only reviewed a subsample of studies testing a link between lifetime trauma and appraisals. It may therefore have been more beneficial to have first conducted a review of studies testing the link between an unrestricted definition of trauma and appraisals. Childhood trauma and childhood interpersonal trauma could then be included as a subsection of this review. If this were to be done, the search could be broadened by using a wider range of search terms. A greater range of search engines could also be used to widen the search.

The narrow spectrum of appraisals measured appeared to be driven by the assessment tools available. In order to gain a fuller understanding of crucial helpful and unhelpful appraisals, it would be beneficial if a broader range were explored. The AANEX and the IVI may be useful for doing this.

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Appendix A: References for review studies

Table A1: References for studies using clinical samples

Authors, date and location	Title	Reference
1. Lovatt <i>et al.</i> (2010)	Psychotic-Like Experiences, Appraisals, and Trauma	Journal of Nervous and Mental Disease 198(11), 813-819.
2. Andrew <i>et al.</i> (2008)	The relationship between trauma and beliefs about hearing voices: a study of psychiatric and non-psychiatric voice hearers	Psychological Medicine 38(10), 1409-1417.
3. Kilcommons & Morrison (2005)	Relationships between trauma and psychosis: an exploration of cognitive and dissociative factors.	Acta Psychiatrica Scandinavica 112(5), 351-359.
4. Hardy <i>et al.</i> (2005)	Trauma and hallucinatory experience in psychosis.	Journal of Nervous Mental Disease 193(8), 501-7.
5. Offen <i>et al.</i> (2003)	Dissociation as a mediator of the relationship between recalled parenting and the clinical correlates of auditory hallucinations.	British Journal of Clinical Psychology 42, 231-241.
6. Offen <i>et al.</i> (2003)	Is reported childhood sexual abuse associated with the psychopathological characteristics of patients who experience auditory hallucinations?	Child Abuse & Neglect 27(8), 919-927.

Table A2: References for studies using non (psychosis related) clinical samples

Authors, date and location	Title	Reference
1. Kilcommons <i>et al.</i> (2008)	Psychotic experiences in people who have been sexually assaulted.	Social Psychiatry and Psychiatric Epidemiology 43(8), 602-611.
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3. Gracie <i>et al.</i> (2007)	The association between traumatic experience, paranoia and hallucinations: a test of the predictions of psychological models.	Acta Psychiatrica Scandinavica 116, 280–289.
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JOURNAL ARTICLE 1

The adaptation of the Interpretation of Voices Inventory (IVI) to include factors measuring personalising, normalising and danger to self appraisals.

Emma Lidstone^a & Matthias Schwannauer^b

^a Child and Adolescent Mental Health Services, Andrew Lang Unit, Viewfield Lane, Selkirk TD7 4LJ

^b Department of Clinical Psychology, University of Edinburgh, Teviot Place EH8 9AG

Corresponding author: Emma Lidstone
Tel: 01750 23715
Fax: 01750 725116

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Abstract

Background: The range of voice appraisals that have been measured among voice hearing clinical participants has been limited by the assessment tools that are available. Semi structured interviews have been used to describe and quantify appraisals more broadly, but self report questionnaires are limited.

Method: The Interpretation of Voices Inventory was adapted to measure different aspects of normalising responses to hearing voices. Selected items from the metaphysical factor were used to form a personalising factor. Selected items from the loss of control factor were used to form a hypothesised ‘danger to self’ factor.

Results: This adapted version of the measure was tested on 113 voice hearing participants. Confirmatory Factor Analysis was used to test the factor structure of the measure. Some items shared greater amounts of covariance with and contributed more strongly to their factors. Subtle differences between items were highlighted; this reduced the construct validity of the measure.

Discussion: It would appear that the adapted measure provides a promising start to the development of a self report questionnaire that measures a different range of appraisals than is currently available. The factor loadings indicate that further item development and testing may be required.

Introduction

Context

The widespread use of the versions of the Beliefs about Voices Questionnaire (BAVQ; Chadwick & Birchwood, 1995 and BAVQ-R; Chadwick, Lees & Birchwood, 2000) has resulted in the voice appraisal literature being dominated by studies exploring perceived malevolence, benevolence and omnipotence. Other than the BAVQ, the most commonly used self report appraisal measures related to perceived voice power and aspects of voice superiority.

Mawson, Cohen and Berry (2010) identified 26 studies published between 1990 and 2008 that tested this proposed link between voice appraisals and distress. Of these 26 studies, 13 tested the impact of perceived malevolence on distress. Of the 26 studies, 24 studies measured an aspect of voice dominance or supremacy.

Garety, Kuipers, Fowler, Freeman and Bebbington (2001) proposed that a psychotic outcome would only occur if individuals appraised their anomalous experiences as externally caused and personally significant. They referred to Peters, Joseph and Garety's (1999) reflection that experiences are only classified as 'psychotic' if the experiencer reports accompanying delusional ideation about voice origin and significance.

As predicted by Garety *et al.*, perceived internal versus external cause and perceived personal significance versus non significance has been shown to relate to clinical outcome. Brett *et al.* (2007) reported that their clinical participants were less likely to make 'psychological' or 'normalising' appraisals than non clinical, undiagnosed participants who reported anomalous experiences. The clinical sample were also more likely to make 'biological' appraisals and 'caused by other people' appraisals

Lovatt, Mason, Brett and Peters (2010) sought to replicate Brett *et al.*'s results by comparing appraisals made by clinical and non clinical participants reporting at least 'occasional' anomalous experiences. They used a brief form of the same interview and replicated Brett *et al.*'s differences between the groups in making 'caused by other people' appraisals versus 'normalising' and 'psychological' appraisals. Interestingly, they did not replicate the difference between groups in 'biological' appraisals. Lovatt *et al.* also reported that the clinical group appraised their auditory hallucinations as being more dangerous and being caused by an agency targeting them personally (personalising) rather than an impersonal cause.

Based on these results suggesting the importance of normalising, personalising and danger appraisals in predicting distress, the authors sought to identify a self report questionnaire that would measure these factors. The exploration of the personalising factor was deemed to be particularly interesting in light of the mixed evidence for its effect as reported by The Systematic Review.

Relevant reviews

Ratcliff, Farhall and Shawyer (2010) conducted a review of assessment tools for auditory hallucinations. In their article, they reviewed appraisal measures and provided details of the reliability and validity for each. Ratcliff *et al.* commented on the increased number of self report measures they identified in comparison to Frederick and Killeen's (1998) review of available assessment tools 10 years earlier. Ratcliff *et al.* identified two semi structured interview schedules and 8 self report questionnaires and compared this with Frederick and Killen's identification of seven semi structured interviews and 3 self report measures.

The measures reviewed by Ratcliff *et al.* (2010) that included an appraisal or belief element are shown in Table 1. Many of the factors measured by the assessment tools relate to voice dominance and superiority. A self report exception to this was the Hamilton Program for Schizophrenia Voices Questionnaire (HPSVQ; van Lieshout & Goldberg, 2007) that measured the impact of voices of self appraisal.

Table 1: Measures reviewed by Ratcliff *et al.* (2010)

Measure	Type of measure	Appraisals measured
Psychotic Symptom Rating Scales – Auditory Hallucinations (PSYRATS-AH; Haddock <i>et al.</i> , 1999)	Interview	Conviction in beliefs about origin Controllability
Hamilton Program for Schizophrenia Voices Questionnaire (HPSVQ; van Lieshout & Goldberg, 2007)	Self report	Impact of voices on self appraisal
Beliefs about voices questionnaires (BAVQ; Chadwick & Birchwood, 1995) (BAVQ-R; Chadwick <i>et al.</i> , 2000)	Self report	Malevolence Benevolence Omnipotence
Voice Power Differential (VPD; Birchwood <i>et al.</i> , 2000)	Self report	Voice strength Voice confidence Voice respect Ability to harm self Superiority Knowledge
Voice and You Scale (VAY) Hayward <i>et al.</i> (2008)	Self report	Voice dominance Voice intrusiveness Hearer distance Hearer dependence

Mawson *et al.* (2010) reviewed studies testing the cognitive model for auditory hallucinations between the years 1990 and 2008. Their review of relevant studies showed that versions of the BAVQ and versions of the PSYRATS were the most commonly used tools for measuring appraisals. In addition to the measures reviewed by Ratcliff *et al.* they reported an additional eight measures. Details of these measures are shown in Table 2.

Table 2: Additional measures identified by Mawson *et al.* (2010)

Measure	Type of measure	Appraisals measured
Mental Health Research Institute Unusual Perceptions Schedule (MUPS; Carter <i>et al.</i> , 1995)	Interview	Relationship and emotive aspects Cognitive processes
Voice Self Report Scale (VSRS; Hustig & Hafner, 1990)	Self report	Intrusiveness of voices
Voice Rank Scale (VRS; Birchwood <i>et al.</i> , 2000)	Self report	Voice hearer rank relative to their dominant auditory hallucination
Characteristics of Auditory Hallucinations Rating Scale (CAHRS; Oulis <i>et al.</i> , 2007)	Self report	Appraisals of control Affective congruence with content
Cognitive Assessment Schedule (CAS; Chadwick & Birchwood, 1994)	Self report	Voice identity Voice meaning Voice power
Voices Acceptance and Action Scale (VAAS; Shawyer <i>et al.</i> , 2007)	Self report	Voice acceptance Autonomous action
Distressing Voices Questionnaire (DVQ; Morrison & Baker, 2000)	Self report	Voice related distress
Interpretation of Voices Inventory (IVI; Morrison <i>et al.</i> , 2002)	Self report	Metaphysical beliefs (including personalising items) Loss of control Positive beliefs

Of these assessment tools, many of the factors also related to voice dominance and superiority. Self report exceptions to this included the VAAS that measured voice acceptance, VSRS that measured voice intrusiveness and the IVI that measured metaphysical and positive beliefs.

The two interview measures (the PSYRATS-AH and the MUPS) appeared to measure a broader range of voice appraisals than any of the self report tools. However, the categorisation and scoring of appraisals on both of these measures made use of clinical judgment instead of set questions relating to these concepts. Therefore neither of these interviews could be used to provide items that were designed to measure normalising, personalising or danger appraisals.

The only tools that were identified as having been tested in relation to trauma (as reported by The Systematic Review) were the BAVQ, the IVI and the Appraisals of Anomalous Experiences interview (AANEX; Brett *et al.*, 2007) interview. The IVI was the only self report questionnaire that provided measurement of an alternative range of appraisals to those measured by the BAVQ. This measure particularly suited the author's requirements because Morrison, Northard and Wells (2002) had already reported a sub selection of the items from the metaphysical factor as measuring 'personalising' appraisals.

The Interpretation of Voices Inventory

The IVI is a 26 item self report questionnaire designed to measure interpretations in response to the real or imagined experience of auditory hallucinations.

Morrison *et al.* (2002) reported that among non patients, metaphysical beliefs about auditory hallucinations emerged as the only independent predictor of distress. Distress was best predicted by three key 'personalising' items: 'they mean I am possessed', 'they mean I am a bad person' and 'they mean I have done something bad'. Similarly, Morrison, Northard, Bowe and Wells (2004) used the measure with 41 participants who met DSM-IV criteria for schizophrenia, schizoaffective or schizophreniform disorder, and were currently experiencing auditory hallucinations. They found that only the metaphysical beliefs and loss of control factors showed predictive validity by differentiating between patients and controls.

The measure was validated with 132 non clinical participants. Three factors were identified with high levels of internal consistency: metaphysical beliefs, positive beliefs and loss of control ($\alpha=0.94$, $\alpha=0.8$, $\alpha=0.88$ respectively). Test re-test reliability was calculated after a period of 4 to 6 weeks, before and after scores correlated for each subscale with $r>0.7$ (Morrison *et al.*, 2002).

Adaptation of the IVI

The AANEX-CAR, which was used by Brett *et al.* and Lovatt *et al.*, measures 'other people' appraisals, normalising appraisals, psychological appraisals, spiritual appraisals and medical appraisals. It also quantifies a further four dimensions of appraisals; 'dangerousness', 'externality', 'valence' (positive versus negative) and 'agency' (personal versus impersonal). Appraisals are elicited from participants by asking them, 'When you have this experience, what do you think has happened/is going on?'. They are then asked 'What sense do you make of it?'. This is followed up by questions about emotional, cognitive and behavioural responses and endorsement of alternative interpretations.

Unfortunately, because the AANEX does not provide specific questions relating to the appraisals it measures, it was not possible to use items from it to construct a self report version. The adaptation of the IVI was therefore informed by the categories of the appraisals measured by the AANEX but did not involve using material from it.

Normalising items

On searching for auditory hallucination measures that quantified normalising to some extent, the Maastricht Interview (Corstens, Escher & Romme, 2008) was identified. This interview is used as a clinical and research tool and incorporates the following two items:

- *The voices are symptoms of an illness*

Although in some senses this item may relate more specifically to insight of illness, it was felt that it would be interesting to see if it covaried with other normalising items.

- *The voices are one or more parts of my personality*

It was felt that this item might measure ‘psychological’ normalising well.

In addition to these two items, two items were constructed to represent normalising ‘psychological’ appraisals that Morrison (2001) suggested in his theoretical paper may limit distress:

- *They are a sign that I am stressed*
- *I need to sleep, I must be very tired*

The author then broadened the search for measures incorporating normalising items to other psychosis and schizophrenia related symptoms. This highlighted the Beliefs about Paranoia Scale (BAPS; Morrison *et al.*, 2005), a 31 item questionnaire that was developed to measure beliefs about paranoia. All four of the subscales (negative beliefs about paranoia, beliefs about paranoia as a survival strategy, positive beliefs about paranoia and normalising beliefs) were reported to associate with measures of paranoia, dimensions of delusional ideation and trait anxiety when tested with undergraduate students. The internal consistency for the normalising beliefs factor was $\alpha=0.6$. The authors highlighted a need to further develop this factor. Three normalising items from the subscale were identified that made links between psychotic experiences and a continuum of human experience. These were felt to translate well to the experience of auditory hallucinations.

The following three items from the BAPS normalising subscale were selected:

- *Everybody is paranoid on some level*
- *Paranoia is something everybody has to some extent*
- *Being paranoid is just human nature*

These were then adapted to relate to auditory hallucinations:

- *Everybody hears something that can't be explained at some point in their lives.*
- *Nobody can be 100% sure of what they hear*
- *Being confused by or feeling unsure of a sound is part of being human*

Personalising items

The term 'personalising' has been used by researchers in conceptually similar but subtly different ways. The AANEX-CAR measures whether the participant reports a sense that their experiences are caused by an agency that personally is targeting them. The alternative is that the participant associates their experiences with an impersonal cause.

Morrison *et al.* (2002), on the other hand, identified three items that best predicted distress from their metaphysical subscale. They described these items as measuring 'personalising' appraisals:

- *They mean I am possessed*
- *They mean I am a bad person*
- *They mean I have done something bad*

All three of these items link the experience of auditory hallucinations to a negative quality about the voice hearer. They also indicate self blame as the attribution for the cause of the experiences without explicitly stating it. In line with this rationale, two additional items from the IVI metaphysical subscale were identified:

- *They mean I am being punished*
- *They are a sign that I am evil*

Morrison *et al.*'s (2002) conceptualisation of 'personalising' related to the concept measured by the AANEX-CAR but has a more specific interpretation. For a response to qualify as 'personalising' on the AANEX-CAR, the sense of an agency targeting the person for any reason can be described. The 'personalising' items on the IVI, on the other hand, specify that the perceived reason for being targeted is a negative quality about the voice hearer and

therefore constitute self blame. Because a negative view of self and self blame was highlighted by The Systematic Review, Morrison's definition of personalising and personalising items were used.

Danger to self items

Both Brett *et al.* (2007) and Lovatt *et al.* (2010) reported that the AANEX-CAR score of appraised danger of voices (versus harmlessness) differentiated between their clinical and non clinical group.

One of the measures identified by Mawson *et al.*, the VPD, was highlighted as measuring the ability of voices to harm self. The VPD measures this concept with one question on a five point Likert scale ranging from, 'I am much more able to harm my voice than it is able to harm me' to 'My voice is much more able to harm me than I can harm it'.

The IVI 'loss of control' factor consisted of six items. From these six items, three items were selected that were felt to associate with the appraisal that voices could harm or endanger the voice hearer. The remaining items associated more closely with harming others and obeying the voices without reference to danger to self.

The three items that were selected to form the 'danger to self' category were:

- *They will harm me physically*
- *They mean I will harm myself*
- *If I do not obey them something bad will happen*

These items created a factor that was similar to the AANEX-CAR factor but more personally significant because it specified danger to self. Conceptually, this combines voice omnipotence and malevolence. In order for voices to pose a real threat to the voice hearer, they are required to be malevolent enough to wish to harm him or her and omnipotent enough to execute it.

Method

Sample: 113 voice hearing participants completed the adapted IVI online and in person via hearing voices groups.

All participants agreed with the statement ‘I have heard voices or noises that other people could not hear within the last three months’ before completing the questionnaires. There were 39 males, 59 females and 15 participants who did not disclose their gender. Participant age ranged between 15 and 72 years. Participants were asked to indicate whether they had been given a diagnosis in relation to hearing voices or noises and the age at which they had received it. As would be expected, the most common age bracket for receiving a diagnosis was 15 to 25. A number of participants also reported comorbid diagnoses. These included depression, anxiety, bipolar disorders, personality disorders and dissociative disorders. A breakdown of the main, voice hearing related diagnoses identified by the participants are shown below in Table 3.

Table 3: Breakdown of participants by diagnosis

Diagnosis	Number of participants
Schizophrenia	43
No diagnosis	21
Schizoaffective	16
Psychosis	5
Bipolar	4
Psychotic depression	3
PTSD	3
Borderline personality disorder	2
Diagnosis received but undisclosed	1
Missing	15

Design: The study used a cross-sectional design. Analyses were conducted on the sample as a whole.

Measures: All participants were asked to input their age, gender, and whether they had received a diagnosis related to hearing voices. Participants then completed the adapted version of the IVI.

Method: The clinical sample was recruited by mixed methods. Adverts for the study were posted on the following schizophrenia and psychosis support forums: Schizophrenia.com, Schizophreniaforums.com, MDjunction.com, Mytherapy.com, Ehealthforum.com, Topix.com, and Social-medicine.org. Adverts were posted on Twitter and Tumblr with the keywords: schizophrenia, psychosis, hearing voices and auditory hallucinations. An advert was also posted as a public message via Yahoo questions. Some individuals on Tumblr and Social-medicine.org who had identified themselves as experiencing auditory hallucinations were emailed an advert directly.

Twelve participants were recruited via four Hearing Voices Groups in the UK. An email advertising the project was sent to all Hearing Voices group leaders using an email distribution list provided by the Hearing Voices network and contact details provided on the Hearing Voices website.

Results

Distribution

The distributions of responses to the items on the measure were tested for normality. The skewness and kurtosis statistics for most of the items were calculated as more than double the standard error. Because the sample was greater than 50, the Kolmogorov-Smirnov test was also used to further test the distribution of the data. The Kolmogorov-Smirnov statistic indicated that the assumption of a normal distribution should be rejected.

The skewness statistics were calculated as more than double their standard error for both the personalising and human experience factors, suggesting that the assumption of normality should be rejected for these factors. The kurtosis statistic was calculated as more than double the standard error for the ‘danger to self’ factor suggesting that the assumption of normality should be rejected.

Because the sample was greater than 50, the Kolmogorov-Smirnov test was also used to further test the factor distributions. All of the factor distributions were indicated as being significantly different from an assumed normal distribution. Square root and logarithmic conversion methods did not sufficiently correct this.

On looking at the distributions using histograms and boxplots, it could be seen that the skew in each of the distributions was caused by the majority of participants endorsing the least clinical response. The rates of endorsement of items and factors then declined to form a slope so that the smallest number of respondents endorsed the most clinical response.

The authors concluded that the distributions had been impacted by the narrow four point Likert scale that had been used and the very specific population that had been consulted. As identified, the factors evoked strong majority responses and small numbers deviated from this. This resulted in the distributions appearing as either the bottom half or the top half of the normal curve. It was concluded that this deviation from normality was to be expected from the questions that were asked and were in fact felt to be indicative of validity.

It was concluded that the normality test results indicated that the scores were on the cusp of normality and provided enough justification to proceed to using structural equation modeling. This was decided because structural equation modeling using the maximum likelihood estimator has been shown to be robust in its use with non normal distributions (Hu & Bentler, 1998).

Missing data

Missing data was calculated as contributing to less than 5% of the data set. Little's (1988) Missing Completely at Random test for each item was non significant, indicating that the missing data could be categorised as missing at random. This made the data eligible for the use of data imputation methods. Using MPlus and Maximum Likelihood as the estimator for the factor analysis, Full Information Maximum Likelihood was the missing data imputation method that was used.

Testing the measure's construct validity

The statistical package, MPlus version 5, was used to carry out Confirmatory Factor Analysis (CFA) to test the construct validity of the appraisal measure that was adapted for use by the study. The reporting of these results was informed by Schreiber, Nora, Stage, Barlow and King's (2006) recommendations.

Although the chi square has many problems associated with it, it is still essential that it is always reported alongside degrees of freedom and associated p value (Kline, 2005). Hu and Bentler (1999) examined cut offs for many of the other indices. They recommended that a combination of one of the relative fit indexes and the SRMR (good models < .08) or the RMSEA (good models < .06) should be reported. Similarly Kline recommended reporting chi square, the RMSEA, the CFI and the SRMR. It should be noted that there has been debate about how strictly fit index 'rules of thumb' should be adhered to. It is generally agreed (to varying extents) that cut off values can lead to instances of Type I error and that some flexibility may be considered in circumstances where it can be justified theoretically (Marsh, Hau & Wen, 2004).

As shown below in Table 4, the covariances between factors all fell below 0.85. The factors were therefore deemed to be satisfactorily distinct.

Table 4: Covariance between factors

Factors	Normalising (Psychological)	Normalising (Human experience)	Danger to self
Personalising	-0.010	-0.059	0.499
Normalising (Psychological)		0.063	-0.054
Normalising (Human experience)			-0.149

As shown in Table 5, all factors were identified as contributing significant amounts of variance to the data. The ‘danger to self’ factor in particular shared 78% of its variance with the overall model.

Table 5: Variance by factor

	Estimate	Standard error	Estimate / S.E.	Two-tailed p value
Personalising	0.482	0.145	3.317	0.001
Normalising (psychological)	0.268	0.133	2.019	0.044
Normalising (human experience)	0.583	0.185	3.149	0.002
Danger to self	0.782	0.186	4.211	0.000

The R-square statistics for each item (showing the degree of variability explained by the respective factor) are shown below in Table 6. As Morrison *et al.* (2002) did, items were required to load above 0.4 to be deemed as contributing to a factor. Items 11 and 21 from the personalising factor were the only items to share less than 40% covariance with their corresponding factor. With the exception of item 7, ‘They are one of more parts of my personality’, all items had statistically significant loadings on their respective factors (Z statistics greater than 1.96). Because item 2 appeared to co vary with item 7, removal of it was also considered. Those items considered for removal are marked in grey.

CFA was first conducted with all of the proposed items. Following this, items 11, 21 and 7 were removed and a CFA was conducted again. Following this, item 2 was removed alongside items 11, 21 and 7. Statistics for how well these factor structures fitted the data are shown in Table 7. It can be seen that the removal of all four of the items resulted in the best model fit. This model fitted the data adequately and the associated statistics fell within recommended cut of limits. The version of the Adapted IVI resulting from this analysis is shown in Appendix A.

Table 6: Residual variances by item for each factor

Personalising (self blame)	Residual variance
1) They are a sign that I am being punished.	0.802
4) They mean I have done something bad.	0.719
11) They are a sign that I am evil.	0.364
13) They mean I am possessed.	0.710
21) They mean I am a bad person.	0.337

Normalising (psychological)	
2) They are symptoms of an illness	0.991
7) They are one or more parts of my personality	1.085
15) They are a sign that I am stressed.	0.669
16) I need to sleep, I must be very tired.	0.690

Normalising (human experience)	
9) Everybody hears something that can't be explained at some point in their lives.	0.701
17) Nobody can be 100% sure of what they hear.	0.620
18) Being confused by / unsure of sounds is part of being human.	0.583

Danger to self	
12) They will harm me physically.	0.623
19) They mean I will harm myself.	0.551
20) If I do not obey them, something bad will happen.	0.527

Table 7: Model fit statistics for different factor structures of the AIVI

Statistic	Chi square (df)	p value	RMSEA	SRMR	CFI
Recommended cut off	X^2/df range of 2 - 5	Non sig >0.05	<0.06	<0.08	>0.95
Score for model	165.578 (84)	0.0000	0.094	0.081	0.848
Score for model after removal of items 11, 21 and 7.	89.018 (48)	0.0003	0.088	0.076	0.881
Score for model after removal of items 11, 21, 7 and 2.	54.573 (38)	0.0398	0.063	0.060	0.946

Discussion

The confirmatory factor analysis results suggested that most of the items contributed acceptably to the predicted factors. All of the items that contributed to form the normalising (human experience) factor shared acceptable levels of variance. All of the items that contributed to the 'danger to self' factor also shared acceptable levels of variance.

The two personalising (self blame) items describing the belief that voices occur as a result of 'punishment' or having 'done something bad' covaried with each other well. These two 'punishment' items covaried with 'they mean I am possessed' but did not covary with 'they are a sign that I am a bad person' or 'they are a sign that I am evil'.

These results differed from the three items that Morrison *et al.* (2002) identified as 'personalising' and best predicted distress from their metaphysical subscale. The items that they identified were '*they mean I am possessed*', '*they mean I am a bad person*' and '*they mean I have done something bad*'.

When Morrison *et al.* conducted factor analysis on their responses to the IVI, a three factor solution was generated. The metaphysical factor contained items that related to spiritual explanations for voices and items that attributed voice hearing as a response to negative qualities in the voice hearer. The personalising items that they identified were the items that predicted distress best and loaded best onto the metaphysical factor. It should be noted that Morrison *et al.* only tested item loadings on the metaphysical factor as a whole; they did not test correlations or covariances between these items as a subset.

The present study attempted to isolate the personalising items from the metaphysical ones so that personalising could be explored as a discrete factor. It is interesting that the confirmatory factor analysis by the present study appears to suggest a divide between the appraisal of voices as a negative external force (that punish and possess) versus a negative internal force associated with the voice hearer being evil or bad. It is possible that this apparent difference has been highlighted because covariances were calculated using this smaller selection of items. It is equally possible that it reflects an idiosyncrasy in the data that would not be replicated.

The two normalising (psychological) items relating tiredness and stress to the experience of hearing voices covaried acceptably. 'They are one or more parts of my personality' did not share a significant amount of variance with the factor. Because 'they are symptoms of an

illness' appeared to covary better with this item than the 'tiredness' and 'stress' items, this item was removed in the final version of the factor structure. This structure was the only one that fitted the data adequately.

It is not surprising that the normalising factors covaried in this way. Stress and tiredness were recommended as normalising concepts by Morrison (2001) whereas the other two items were sourced from the Maastricht Interview (Corstens *et al.*, 2008). The tiredness and stress items measure an awareness of generally accepted factors that cause voices to fluctuate. Illness and personality based explanations, on the other hand, are rooted in explanatory models that are more contentious.

When developing the AANEX, Brett *et al.* (2007) constructed 'psychological explanations' and 'normalising' (part of the spectrum of normal human experience) as separate factors. When Lovatt *et al.* (2010) used it, they collapsed these factors. The results from the present study provide support for the separation of these categories.

Limitations

Due to limited participant numbers it was not possible to use the split half method to test the reliability of the factors that were generated. Sayer, Ritter and Gournay (2000) showed that appraisals made by voice hearers change over time. It would therefore be particularly interesting to assess the measure's reliability using the test retest method. It would be helpful in the development of our understanding of the relationship between appraisals and distress if changes in appraisals over time were compared with changes in distress.

Future directions

This study has highlighted the differing definitions that have been used by researchers to categorise appraisals. It has highlighted the importance of explicitly defining appraisal definitions and giving examples of items used to measure appraisals. This allows for the comparison of results from studies without losing sight of potentially differing underlying concepts driving categorisation.

It is hoped that the development of this measure might be continued; and that its use might broaden the range of appraisals that are studied. It is hoped that this might enhance understanding of how voice appraisals are developed and how they relate to distress. It is hoped that this understanding will contribute to the development of interventions targeting appraisals and that these will be clinically helpful.

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Appendix A: Adapted Interpretations of Voices Inventory

The experience of hearing sounds and voices when there is nothing there to explain it is a common one. It is particularly common when under stress, falling asleep or waking up. Listed below are a number of attitudes and thoughts that people have expressed about hearing unexpected sounds or voices. There are no right or wrong answers. Please give a response about how you generally feel.

Please read each statement and then circle the number which corresponds to how much you believe this. Please give a response to all the statements.

If I were to hear sounds or voices that other people could not hear, I would probably think that....	Not at all	Some what	Moderately so	Very much
They are a sign that I am being punished.	1	2	3	4
They are symptoms of an illness.	1	2	3	4
They would make me harm someone.	1	2	3	4
They mean I have done something bad.	1	2	3	4
They mean that I am close to God.	1	2	3	4
They mean I will do bad things.	1	2	3	4
They are one or more parts of my personality.	1	2	3	4
They mean that I have been chosen.	1	2	3	4
Everybody hears something that can't be explained at some point in their lives.	1	2	3	4
They have come from the spiritual world.	1	2	3	4
They are a sign that I am evil.	1	2	3	4
They will harm me physically.	1	2	3	4
They mean I am possessed.	1	2	3	4
They have to be obeyed.	1	2	3	4
They are a sign that I am stressed.	1	2	3	4
I need to sleep, I must be very tired.	1	2	3	4
Nobody can be 100% sure of what they hear.	1	2	3	4
Being confused by / unsure of sounds is part of being human.	1	2	3	4
They mean I will harm myself.	1	2	3	4
If I do not obey them, something bad will happen.	1	2	3	4
They mean I am a bad person.	1	2	3	4

Personalising items: 1, 4, 13
Danger to self items: 12, 19, 20

Normalising (psychological) items: 15, 16
Normalising (human experience) items: 9, 17, 18

THESIS HYPOTHESES

It was proposed that childhood interpersonal trauma would predict appraisals of ‘self blame’ and ‘danger to self’ in response to auditory hallucinations.

It was hypothesised that these appraisals would predict different types of coping; that ‘self blame’ would prevent the use of interpersonal coping and that ‘danger to self’ would prevent acceptance based strategies.

It was predicted that interpersonal and acceptance based coping would precipitate wellbeing and that this effect would be moderated by the development of normalising appraisals.

It was predicted that normalising appraisals would take the form of psychological explanations (such as stress or tiredness) for the experience of auditory hallucinations.

An alternative form of normalising appraisals was also proposed. This involved the voice hearer thinking of auditory hallucinations as a ‘normal’ phenomenon on a continuum of human experience.

METHOD

Consultation with services

The researcher consulted representatives from two schizophrenia services on the length and format of the questionnaire pack. This took the form of emailing one representative from the Scottish Recovery Network and discussing the project with a hearing voices team in Glasgow.

Both groups highlighted that many of their clients had difficulties with reading, writing and concentration. Regardless of whether these result from underlying cognitive and learning problems, the distracting effect of positive symptoms or medication side effects, it was clear the questionnaire pack needed to be short and simple.

The team in Glasgow highlighted that participation could fuel paranoid thinking. In light of this they recommended that the appraisals questionnaire (the questionnaire that most explicitly asked about voices) be completed first to limit initial anxiety from being asked unexpected questions. They also recommended that a large container full of completed questionnaire packs be made visible to participants to reassure them and limit any feelings of being different or singled out. They felt that the large container with completed questionnaires would also reassure the participant that their response would be unidentifiable.

Both groups highlighted the sensitive nature of the trauma questionnaire. The Glasgow team recommended that the sexual abuse item was worded more sensitively. They also highlighted the possibility that participants might feel upset, not only by being reminded of previous trauma, but by an awareness that they had answered 'yes' to all of the trauma items. They therefore recommended that additional questions be added to the trauma questionnaire. Despite appreciating this point, the researcher did not act on this recommendation. Questions were not added so that the questionnaire pack could remain as short as possible. It also allowed the trauma questionnaire to be presented in the same format as it had been validated in.

Ethical considerations

Permission to conduct the study was gained from the University of Edinburgh ethics board. A copy of the ethics application and response from the university is provided in Appendix I. A representative from NHS ethics was also consulted and the project was confirmed as not

needing NHS ethical approval because participants were not recruited as NHS patients or via NHS services. The ethical considerations and actions that were taken in response to the issues that were highlighted are described below.

Clinical responsibility

Because none of the questionnaires measured any aspect of risk to the participant or others, there was no need to address any clinical obligation to pass information on.

Consent

The consent form was separated from the questionnaire pack after completion to anonymise responses. On the consent form participants were asked to indicate that they had read and understood:

- That they would not be asked to provide a name or any other identifying information on the questionnaire pack - and that this meant that their response would remain anonymous.*
- That some of the questions might be upsetting and that they did not have to answer any questions they felt uncomfortable with. Also, that they could stop filling out the questionnaire at any time.*
- That a poster summarising the results of the study would be posted on the participating online forums and sent to participating services. Participants were asked to indicate if they wished to receive their own personal copy of this.*

Distress

The main ethical issues associated with the project were identified as:

- The possibility that participants might struggle with reading, writing and concentration.
- The possibility that participants might feel distressed in response to being asked if they had experienced different types of interpersonal trauma in childhood.
- The possibility that participation might fuel paranoid thinking and cause distress.

In response to these identified risks, the following measures were taken:

- The questionnaire pack was constructed using the minimum number of questions possible.
- Instructions were given as clearly and briefly as possible.
- Helpline numbers were provided on the consent form.

- Participants from Hearing Voices groups were given the name of a member of staff that they could discuss the project with (and any feelings that arose).
- Online participants were advised to talk to someone they found supportive if they felt upset after completing the questionnaire.
- The sexual abuse question on the ACE questionnaire (Felitti et al., 1998) was amended so that it was worded more sensitively:
'Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way?
or
Try to or actually have oral, anal, or vaginal sex with you?'
 Was changed to
'Did an adult or person at least 5 years older than you ever have contact with you in a sexual way?'
- Completed consent forms were taken back separately from completed questionnaires
- Completed consent forms and completed questionnaires were inserted into identical unmarked envelopes that were added to a bag that visibly contained other envelopes that looked the same
- The measure asking most clearly about auditory hallucinations was used as the first questionnaire in the questionnaire pack
- Participants were invited to provide comments or feedback at the end of the questionnaire.

Incentive to participate

Careful consideration was given regarding the use of an incentive to make participation more attractive. Grant and Sugarman (2004) discussed the appropriate use of incentives with human participants and highlighted factors that made their use ethically problematic. These factors were: when participants had a dependency relationship with the researcher; when the risks associated with participation were particularly high; when participation involved degradation of some kind; when a large incentive was required because the participant's aversion to the study was strong; and when the aversion was a matter of personal principle.

Online participants were invited to email the researcher so that a summary of the results could be emailed directly to them. Participants were also invited to email the researcher to enter a prize draw for £50 Marks and Spencer's vouchers. Groups of participants that submitted more than 5 completed questionnaire packs were also given a Marks and

Spencer's voucher to buy biscuits. Participants from these groups were also entered into the prize draw. It was felt that this arrangement did not meet any of the criteria identified by Grant and Sugarman.

Questionnaire pack

The Interpretations of Voices Inventory (IVI; Morrison *et al.*, 2002) was adapted for use by the study. The Brief COPE (Carter, 1997) was also adapted.

Clinicians had recommended the use of the Adapted Interpretations of Voices Inventory as the first questionnaire. The trauma measure was placed last in the questionnaire pack. This was done so that if a participant felt upset by the trauma measure, they would have already completed the questionnaire pack and would not need to complete anything else. This also meant that any emotional reaction resulting from the completion of the trauma measure would not influence ratings on the other measures.

The questionnaire pack was constructed by putting the questionnaires in the following order:

Page 0)	Consent form
Page 1)	Adapted Interpretations of Voices Inventory
Page 2)	Adapted Brief COPE
Page 3)	BBC Wellbeing Scale (Kinderman <i>et al.</i> , 2011)
Page 4)	Adverse Childhood Experiences Questionnaire (Felitti <i>et al.</i> , 1998)
Page 5)	Demographics (age, gender, diagnosis, age at diagnosis, support accessed)
Page 5)	Space for comments

Measures

All participants were asked to input their age, gender, any diagnosis they had received related to hearing voices, the age they received it and what support they were accessing at the time of participation. Each participant was also asked to complete the following questionnaires:

*Adapted Interpretations of Voices Inventory (AIVI) (Lidstone *et al.*, 2012)*

Subscales: normalising, personalising

The Interpretations of Voices Inventory (IVI) (Morrison *et al.*, 2002) is a 26 item self report questionnaire developed to measure appraisals of auditory hallucinations. The adaptation of the IVI is described in Journal Article 1. The inventory originally measured personalising, metaphysical, loss of control and positive appraisals of voices. The positive appraisal items

were replaced with normalising items. They reported acceptable internal consistency and factor structures using a clinical sample of 120 participants.

Brief COPE (Carver, 1997)

Subscales: avoidant coping, interpersonal coping, acceptance

The Brief COPE (Carver, 1997) is a 28 item self report questionnaire developed to measure a broad range of coping strategies to cope with a specified problem or situation. It was selected because it measured avoidant coping, interpersonal coping and acceptance based coping in the form of one brief questionnaire. Carver reported strong correlations between paired items designed to measure different constructs. Because of this, he explicitly instructed the user of the Brief COPE that inclusion of the full range of paired items was not essential.

BBC Wellbeing Scale (Kinderman et al., 2011)

Subscales: psychological, relationship, physical

The BBC well-being scale is a 31 item questionnaire that was developed to measure a broad range of aspects of personal wellbeing. It was chosen so that the impact of appraisals and coping on multiple facets of wellbeing could be explored. When tested with a population sample of 1,940 it demonstrated high levels of internal consistency as a single factor ($\alpha=.94$) and also among its three subscales: psychological well-being, physical health and well-being and relationships ($\alpha=0.93$, $\alpha=0.88$, $\alpha=0.79$ respectively). Among other measures, Goldberg scales of anxiety and depression, a self report measure of adverse experiences in childhood, a list of threatening experiences measure and self blame on an attributions questionnaire correlated with all of the subscales (Kinderman et al., 2011).

Adverse Childhood Experiences Questionnaire (ACE) (Felitti et al., 1998)

Subscales: Emotional abuse, physical abuse, sexual abuse, physical neglect, emotional neglect

The Adverse Childhood Experiences Questionnaire is a 10 item self report questionnaire that was developed by combining items from the Childhood Trauma Questionnaire (Bernstein et al., 1994), Conflict Tactics Scales (Strauss & Gelles, 1990), and sexual abuse questions used by Wyatt (1985). Wingenfeld et al. (2011) tested the German version of the questionnaire with psychosomatic inpatients and adults from the general population. They found that the internal consistency of the ACE was satisfactory and that it correlated highly with scores from the Childhood Trauma Questionnaire.

Some trauma measures include items relating to adverse childhood experiences but also ask about trauma in adulthood and/or non interpersonal trauma. Hardt and Rutter (2004) reviewed articles using retrospective methodology between 1981 and 2001. Although they highlighted an under reporting bias, they concluded that it did not invalidate retrospective studies of major adversities that were easily defined. Dill et al (1991) showed that the use of a confidential self report questionnaire elicited double the number of disclosures than a standard psychiatric assessment. Self report disclosures by psychiatric patients have also been shown to be reliable (Fisher *et al.*, 2011).

The ACE (Whitfield *et al.*, 2005) was chosen because it defines adverse interpersonal experiences during childhood very simply. The occurrence of physical, emotional and sexual abuse in childhood can be identified using this measure for each participant. Whitfield *et al.* used the ACE measure to explore the relationship between childhood experience of trauma and hallucinations in a large population study. They found that the risk of hallucination was increased 1.2 to 2.5 fold by any ACE, regardless of the category. They reported a significant and graded relationship between ACE score and history of hallucination that was independent of a history of substance abuse.

Scoring

The items from the Adapted Interpretations of Voices Inventory are scored by the participant on a four point Likert scale. When entering the data, each item response was given a value between 0 and 3. The items from the Adapted Brief COPE are scored by the participant on a four point Likert scale. When entering the data, each item response was given a value between 0 and 3. The items from the BBC Wellbeing Scale are scored by the participant on a five point Likert scale. When entering the data, each item response was given a value between 0 and 4. An overall mean score for the measure was then calculated and used as an observed variable. Adverse Childhood Experiences Questionnaire is a five item measure that describes five different types of childhood interpersonal trauma. The participant indicates whether they experienced each of the types of trauma by circling 'Yes' or 'No'. 'Yes' responses were ascribed a value of 1 and 'No' responses were ascribed a value of 0. An overall mean score for the measure was then calculated and used as an observed variable.

Recruitment and procedure

An email advertising the project was sent to all Hearing Voices group leaders using an email distribution list provided by the Hearing Voices network and contact details provided on the Hearing Voices website.

Five Hearing Voices groups participated in the study. They were sent questionnaire packs by post or email with the instruction to separate the consent forms from the packs on completion. All of the group leaders discussed participation with their groups and collated the completed questionnaires themselves. The researcher visited one group to talk about the project and collate completed questionnaires in person. A total of 12 participants completed questionnaires via Hearing Voices groups.

Online procedure

Adverts for the study were posted on the following schizophrenia and psychosis support forums: Schizophrenia.com, Schizophreniaforums.com, MDjunction.com, Mytherapy.com, Ehealthforum.com, Topix.com, and Social-medicine.org. Adverts were posted on Twitter and Tumblr with the keywords: schizophrenia, psychosis, hearing voices and auditory hallucinations. An advert was also posted as a public message via Yahoo questions. Some individuals on Tumblr and Social-medicine.org who had identified themselves as experiencing auditory hallucinations were also emailed an advert directly.

These adverts were reposted and commented on by the researcher so that they appeared at the top of the forums for an eight week period. This also provided the researcher with the opportunity to answer any questions that arose about the study.

The consent form and questionnaires were made available online using Survey Monkey. The adverts that were posted online included a link that participants could click on to access the Survey Monkey web address for the study.

A total of 101 online participants completed the Adapted Interpretations of Voices Inventory. These responses were used to contribute to the data set that was used to test the construct validity of the measure. A total of 50 online participants completed the full questionnaire pack. These responses were used to contribute to the data set that was used for the analysis.

Initially, an advert was posted online asking participants to complete the Adapted Interpretations of Voices Inventory and the Brief COPE. These participants were also asked

to provide their age and gender. Three weeks later, another advert was posted and emails sent inviting the respondents to additionally complete the BBC Wellbeing Scale, the Adverse Childhood Experiences Questionnaire and the more detailed demographics and comments page.

Sixty six participants completed the first half of the questionnaires. These responses were used to contribute to the data set used to assess the construct validity of the Adapted Interpretations of Voices Inventory.

Twenty nine participants completed the follow up questionnaires. Unfortunately, only 15 of these responses could be matched by IP address. These were added to the complete data set used for the analysis. These responses of course differed from the other responses because there was a time delay of up to three weeks in the completion of the questionnaire pack.

At this same time, 35 new participants completed the full questionnaire pack online. These responses were used to contribute to both the construct validity data set and the analysis data set.

Details of planned analysis

Confirmatory Factor Analysis and Structural Equation Modeling

The statistical package, MPlus version 5, was used to carry out Confirmatory Factor Analysis (CFA) to test the construct validity of the appraisal measure. It was then used to conduct Structural Equation Modeling (SEM) to test the models constructed from the hypothesised relationships between the measures. Each of the models to be tested predicted that the relationship between interpersonal trauma in childhood and wellbeing would be moderated to some extent by an appraisal and an associated coping strategy.

CFA and SEM are popular statistical methods, particularly among the social sciences. Factors are constructed by defining contributing latent variables that are thought to contribute towards a unified theoretical construct. These factors and their associated latent variables are first tested for their degree of fit to the data using CFA. Once this 'measurement model' is deemed an adequate fit by CFA, predictions can be made about relationships between factors and observed variables. These predictions generate models that can be tested using SEM. CFA and SEM results are reported using the same statistics.

SEM is often used to test mediating and moderating relationships between factors. A series of regressions can alternatively be used, but SEM does these multiple calculations in one execution. Also, regression confounds prediction error with measurement error. Because SEM involves the first step of evaluating the measurement model using CFA, these two types of error can be distinguished. Unlike regression, SEM is based on the assumption that theoretical constructs can be better and more reliably measured using multiple items instead of one. This theoretically allows the researcher to separate some of the error associated with the items from the true measure of the construct.

In simple terms, CFA and SEM involve the calculation of the proportion of the overall variance that is contributed by the variables and factors and compare this with what is predicted. SEM uses this information to compare the fit with either a hypothetical perfectly fitting model or a model in which none of the factors are related.

Different indices are used to indicate how well a proposed model fits the data. Absolute fit indices do not use an alternative model as a base for comparison. They are simply derived from the fit of the obtained and implied covariance. Because chi square is the original fit index and because it is the basis for most other fit indices, it is routinely reported in all SEM results sections. A good model fit results in a non significant result at the 0.05 threshold (Barrett, 2007). Because of this, chi square is known as a 'badness of fit' measure (Kline, 2005). Although the chi square statistic is always reported, it has a number of weaknesses. It assumes multivariate normality; severe deviations from normality can result in the rejection of well fitting models. It is sensitive to sample size and is prone to rejecting models when large sample sizes are used but lacks power to discriminate with small samples (Kenny & McCoach, 2003). One way people have suggested to minimise the impact of sample size on chi square is to divide it by the number of degrees of freedom reported for the model. Acceptable values for this calculation range between 5.0 and 2.0 (Iacobucci, 2010).

The RMR is also an absolute fit index. It, however, is sensitive to the scales that data has been collected with. The standardised RMR (SRMR) resolves this problem and is therefore much more meaningful to interpret. Values less than .05 indicate a good fit (Byrne, 1998; Diamantopoulos and Siguaw, 2000), however values as high as 0.08 are deemed acceptable (Hu and Bentler, 1999). An SRMR of 0 indicates a perfect fit, however a greater number of parameters in a model and large sample sizes lower the statistic.

Relative fit indices compare the chi square for the model that is being tested with a chi square for the same model with no correlation between any of its variables (McDonald and Ho, 2002). They tend to be affected by sample size with the exception of the Tucker Lewis Index (TLI) which has been shown to remain unaffected. Like the SRMR, these statistics tend to range between 0 and 1. An earlier convention used above .90 as a cut off for good fitting models, but there seems to be growing consensus that this value should be increased to approximately 0.95 (Hu & Bentler, 1999).

Unlike absolute and relative fit indices, noncentrality based indices are based on distribution related parameters that have been rescaled so that they are independent from sample size. The Comparative Fit Index (CFI: Bentler, 1990) is the most reported index of this type. It takes sample size into account and performs well with small samples (Tabachnick and Fidell, 2007). As with the relative fit indices, a value greater than 0.90 was thought to be needed in order to ensure that only well fitting models were accepted. However, more recently a value of ≥ 0.95 is recognised as indicative of good fit (Hu and Bentler, 1999).

The RMSEA (Steiger, 1990) has become regarded as one of the most informative fit indices (Diamantopoulos and Siguaw, 2000) due to its sensitivity to the number of estimated parameters in the model. The RMSEA favours parsimony and will show preference for a model with fewer parameters. A cut off value close to .06 (Hu and Bentler, 1999) or a stringent upper limit of 0.07 (Steiger, 2007) was recommended.

Interpreting the results

Although the chi square has many problems associated with it, it is still essential that it is always reported alongside degrees of freedom and associated p value (Kline, 2005). Hu and Bentler (1999) examined cut offs for many of the other indices. They recommended that a combination of one of the relative fit indexes and the SRMR (good models $< .08$) or the RMSEA (good models $< .06$) should be reported. Similarly Kline (2005) recommended reporting chi square, the RMSEA, the CFI and the SRMR.

It should be noted that there has been debate about how strictly fit index 'rules of thumb' should be adhered to. It is generally agreed (to varying extents) that cut off values can lead to instances of Type I error and that some flexibility may be considered in circumstances where it can be justified theoretically (Marsh, Hau & Wen, 2004).

Considerations specific to the present study

Small sample size

Iacobucci (2010) highlighted that 3 or 4 items per factor, good reliabilities between items , and a simple structural path model can lead to SEM working well with samples as small as 50. Since its original articulation by Nunnally (1967), an ad hoc rule of thumb requiring a minimum of 10 observations per factor has been widely used.

Missing data

Enders and Bandalos (2001) ran four simulations using different missing data methods. On comparing full information maximum likelihood (FIML), listwise deletion, pairwise deletion, and response pattern imputation. They concluded that when the data was missing completely at random (MCAR) and missing at random (MAR), FIML estimates were unbiased and more efficient than the other methods. FIML yielded the lowest proportion of convergence failures and made minimal Type 1 errors. Schlomer, Bauman and Card (2010) also used simulations to show that FIML generated acceptable estimations of regression coefficients and standard errors across both types of missing data (MCAR and MAR) as well as across 10% and 20% missing data.

Distribution

Hu and Bentler (1998) and Olsson *et al.* (2000) showed that the maximum likelihood estimation method is relatively robust and endorsed its use for most situations. Some have argued that if sample size falls, non normality can have an impact on outcomes (Lei & Lomax, 2005) while others argued that this is not the case (Finch, West, MacKinnon, 1997). The use of bootstrapping was considered, but it has been shown to perform poorly with small samples (Isaksson *et al.*, 2008).

Dissemination of results

Copies of the summary of the results in plain English were sent to participating Hearing Voices groups and participants that directly emailed the researcher. It was also posted on the forums and websites that had been used to advertise the project.

JOURNAL ARTICLE 2

The relationship between trauma and wellbeing – is it moderated by appraisals and coping? A study reporting the use of SEM to test this.

Emma Lidstone^a & Matthias Schwannauer^b

^a Child and Adolescent Mental Health Services, Andrew Lang Unit, Viewfield Lane, Selkirk TD7 4LJ

^b Department of Clinical Psychology, University of Edinburgh, Teviot Place EH8 9AG

Corresponding author: Emma Lidstone
Tel: 01750 23715
Fax: 01750 725116

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Abstract

Background: Informed by cognitive maintenance models of auditory hallucinations, the present study proposed potential moderating mechanisms of the relationship between trauma and distress. Self blaming and danger to self appraisals were predicted to prevent interpersonal and acceptance based coping respectively. It was predicted that any link between coping and wellbeing would be moderated to some extent by normalising appraisals.

Method: Sixty two voice hearing participants were recruited online and via Hearing Voices groups. Each participant completed short self report questionnaires measuring interpersonal trauma in childhood, voice appraisals, coping and wellbeing. Structural equation modeling was used to test the hypothesised models.

Results: Support was gained for a relationship between appraisals of danger to self and acceptance based coping. Acceptance based coping and wellbeing were shown to be associated strongly by sharing over 70% of their variance. A link between interpersonal coping and psychological explanations for experiences was also observed.

Discussion: Theoretical implications of the results and their relevance to clinical practice are discussed. It may be helpful for practitioners to encourage the use of non avoidant coping strategies when appropriate. Further exploration to understand these psychological mechanisms better is recommended.

Introduction

Trauma and psychosis

There have been a number of reviews of the evidence for the link between adverse childhood events and psychosis. Varese *et al.* (2012) conducted a large meta analysis incorporating results from 41 studies. They calculated effect sizes for different types of adversity and trauma in clinical populations and non clinical populations reporting anomalous experiences. They reported significant effects for sexual abuse, physical abuse, emotional abuse, bullying, parental death and neglect for both populations. There were no differences between the impacts of the different types of traumatic events.

Although these results were not able to indicate any direction of causality, Varese *et al.* highlighted that data from a number of prospective cohort studies indicated temporal causality. Some of the studies controlled for potentially confounding factors (such as comorbid difficulties, ethnicity, education, IQ, drug use, family history and urbanicity). However, interactions between risk factors and possible moderation effects could not be ruled out. The overall odds ratio for the association was calculated was 2.78. Nine out of ten studies that tested for it, reported a dose response effect.

Bentall, Wickham, Shevlin and Varese (2012) highlighted how little is currently known about the psychological mechanisms that underlie people's experiences of auditory hallucinations and paranoia. They proposed that different types of trauma would impact on cognitive processes differently. Dissociation and impaired source monitoring processes have been suggested as key mediators of the relationship between severe trauma in early life (especially sexual abuse) and auditory hallucinations. Paranoid beliefs, on the other hand, are thought to develop from experiences of powerlessness such as victimisation and discrimination. Insecure attachment has been linked to these proposed pathways that result in hypervigilance to social threat and the misattribution of negative experiences to the purposeful action of others.

Bentall *et al.* tested these associations using data from a large population study; these were supported. Participants who had been raped before the age of 16 were approximately 6 times more likely to have experienced auditory hallucinations. Dose response relationships were observed for both outcomes, multiple traumas increased risk.

Trauma and appraisals

The cognitive model purports that distress associated with the experience of auditory hallucinations and other psychotic phenomena is moderated by the interpretation of the experience. As described by Morrison (2001) and Garety, Kuipers, Fowler, Freeman and Bebbington (2001), appraisals of auditory hallucinations are thought to stem from underlying schemata and metacognitive biases formed by an individual's previous experiences. Birchwood *et al.* (2004), for example, suggested that childhood adversity within relationships leads to the development of schemas involving social humiliation and subordination, which in turn fuel voices and paranoia. Garety *et al.* proposed that psychotic beliefs may be held more firmly when consistent with negative beliefs about self (e.g. self is bad), others (e.g. others are hostile) and the world (e.g. the world is dangerous). The Systematic Review reported a small number of studies that indicated a link between trauma and voice appraisals. Fitting with these proposed schemas, malevolent appraisals and appraisals of omnipotence and intrusiveness were reported as being associated with the experience of traumatic events. Perceived benevolence, psychological appraisals and normalising appraisals were inversely related to the experience of traumatic events.

Morrison (1998) and (2001) proposed a model that centred on Clark's (1986) avoidance model for the maintenance of panic. According to the Clark's model of panic, panic attacks arise from the catastrophic misinterpretation of bodily sensations. This misinterpretation is maintained by hypervigilance and safety behaviours in response to the cues that are being monitored. According to Salkovskis (1991), avoidance and safety behaviours prevent the disconfirmation of threat and reinforce misinterpretation and the sense of danger.

It should be noted that Mowrer (1939) was the first person to formulate a 2 stage model linking fear with avoidance. He suggested that fear had a motivating quality; and that if new behaviours generated by this motivation reduced the experience of fear, they would be reinforced by it. He described these new behaviours as being avoidant in nature and that they tended to avoid or prevent the recurrence of the aversive stimulus.

Morrison (1998) described the experience of auditory hallucinations using this same mechanism of maintenance. He proposed that auditory hallucinations are misinterpreted as

threatening and dangerous (physically and psychologically) and that these misinterpretations result in distress. As described by Salkovskis (1991), Morrison proposed that hypervigilance and safety behaviours prevent the disconfirmation of these appraisals; instead they reinforce them and the resulting sense of danger or threat. Examples of safety behaviours described by Morrison included drinking alcohol, breathing exercises, lying down, jogging, shouting at or talking to the voices and seeking interaction from them. Morrison proposed that the reinforced distress associated with the perception of threat could then trigger more hallucinations.

Morrison referred to general population studies reporting high rates of non distressing auditory hallucinations and used these statistics to further liken auditory hallucinations to symptoms of panic. He described both auditory hallucinations and panic as normal human responses to certain events or triggers and that it is the catastrophic misinterpretation of them that precipitates added distress.

Morrison (2001) extended the model to incorporate the impact of relationship experiences on belief formation about self and others. Similarly, Garety *et al.* (2001) described the development of negative dysfunctional schemas in the context of aversive social environments. They both proposed that these beliefs predict how experiential intrusions (including auditory hallucinations) are appraised and experienced.

Ehlers and Clark's (2000) model contends that trauma related symptoms are maintained by excessively negative appraisals of threat that persist long after the traumatic event. According to this model, these appraisals lead to avoidance and suppression of trauma related thoughts and emotions. This avoidance and suppression increases the experience of intrusion and precipitates distress. As with Morrison's (1998) model, this model of distress maintenance shares the same mechanism as Mowrer (1939) and Clark's (1986) two stage models. These shared proposed mechanisms of action illustrate the theoretical overlap between the two fields.

Bak *et al.*'s (2005) longitudinal study provided some valuable evidence for the potentially causal nature of this relationship. They reported data from a large longitudinal population study in the Netherlands. They conducted baseline interviews with 4065 participants who had never been psychotic. Three years later, a follow up interview using the Maastricht Assessment of Coping Strategies (MACS) highlighted 220 participants who had experienced at least one psychotic experience during that time. Of these, 36 participants' experiences

met criteria for DSM-IV diagnosis. Of those that did not report distress, only 1 respondent had been exposed to interpersonal trauma (emotional, physical, psychological or sexual) before the age of 16 (6%) and 15 had not (94%). Of the 21 participants that reported distress, 9 had been exposed to interpersonal trauma before the age of 16 (43%) and 12 had not (57%). Of those reporting distress, participants who had been exposed to trauma reported feeling that their coping strategies were less effective and gave them less perceived control over their experiences.

Coping and wellbeing

It would appear that the relationship between coping with auditory hallucinations and wellbeing is complex and uncertain. Phillips, Francey, Edwards, McMurray (2009) conducted a review of 85 studies that explored coping among individuals with established psychotic disorders. These studies used different measures and definitions of coping and were consequently difficult to compare. Studies using inpatient and outpatient participants at different stages of their illness also made comparisons difficult. Phillips *et al.* reported mixed and conflicting results and concluded that there was no evidence for the superiority of one coping strategy over another. They did highlight the importance of remembering that although studies tended to focus on specific coping strategies, participants seemed to benefit from utilising a varied coping repertoire. It was suggested that this enabled participants to cope better because they could tailor their coping strategies to suit different situations.

Avoidant versus non avoidant coping

Higher rates of insecure attachment have been observed in samples of individuals who have experienced psychosis compared with controls. The insecure-dismissing attachment style, in particular, has been linked with the occurrence of psychosis (Dozier, 1990; Dozier, Stevenson, Lee & Velligan, 1991; Dozier & Lee, 1995). In line with Ehlers and Clark's (2000) cognitive model of PTSD, Morrison *et al.* (2005) reported that suppression or avoidance based coping strategies may exacerbate intrusive thoughts, psychological distress, autonomic arousal, and auditory hallucinations.

Ognibene and Collins (1998) linked coping style with an individual's attachment style. They showed that when stressed, securely attached individuals perceived more available support from friends and family, and actively sought more social support than individuals with insecure attachment styles. Although adults with an insecure-preoccupied attachment style did seek some social support, they used more escape/avoidance strategies than the securely attached group.

Tait, Birchwood and Trower (2004) recruited fifty participants diagnosed with schizophrenia from two urban community mental health teams. Participants that were categorised as using avoidant or sealing over coping strategies reported a more negative view of themselves compared with participants categorised as using integration or approach related strategies. These avoidant participants rated their mothers and fathers as having been less caring and more abusive. On the Revised Adult Attachment Scale (RAAS; Collins, 1996), they scored lower on the 'close' and 'depend' subscales and higher on the anxiety subscale. As may be expected, this insecure attachment style was found to be associated with service disengagement. Despite these differences between the groups, interestingly, they did not differ on depression scores at 6 month follow up.

Sayer, Ritter and Gournay (2000) used the Beliefs About Voices Questionnaire (BAVQ; Chadwick & Birchwood, 1995) to measure the cognitive and behavioural responses to auditory hallucinations of twenty six participants diagnosed with schizophrenia. They showed that benevolent appraisals were linked to coping strategies that involved engagement with voices and that malevolent appraisals were linked to avoidant or resistant strategies. Similarly, Soppitt and Birchwood (1997) reported increased rates of depression among outpatients reporting malevolent voices and resistant coping in comparison with benevolent voice hearers who engaged with their voices.

Interpersonal coping

White, Bebbington, Pearson, Johnson and Ellis (2000) hypothesised that social isolation would reduce an individual's access to alternative and normalising explanations of anomalous experiences and that this would impair their ability to relabel psychotic experiences. Insight was measured by scoring participants' responses when asked about their awareness of having an illness, awareness of the psychiatric nature of the illness and their own explanation for their symptoms. They conducted interviews with a community and inpatient sample of 150 people and found that compared with population norms, participants reported smaller numbers of close friends and close family. In support of their hypothesis, higher levels of insight correlated with having increased numbers of close friends and close family. Participants with better insight reported close social networks similar in size to Brugha's (1995) figures for acute depression. Participants with poorer insight reported close social networks similar in size to Brugha's figures for long term psychiatric disorder.

Interestingly, Cooke *et al.* (2007) conducted a cross sectional study with 57 out patients with schizophrenia and reported that awareness of symptoms and problems correlated with greater distress. A preference for positive reinterpretation and growth related coping style was shown to correlate with lower distress. This was also related to lower symptom awareness or normalising responses. Preference for a mental disengagement related coping style correlated with greater distress and lower awareness of problems. A social support seeking coping style correlated with greater awareness of illness, but interestingly, did not correlate with distress.

These findings replicated Lysaker, Bell, Bryson and Kaplan's (1998) results that reported an association between impaired insight and impaired social function. Lysaker *et al.* proposed that social isolation occurred as a result of decreased insight. White *et al.* proposed the opposite, that insight is facilitated by social contact. Similarly, Morrison (1998) proposed that common avoidant coping strategies such as distraction using the television or radio limits the development of insight by preventing the disconfirmation of unhelpful appraisals.

Acceptance based coping

Acceptance based approaches focus on changing an individual's relationship to their thoughts and feelings rather than trying to change the content directly. It is hoped that learning to mindfully observe negative thoughts, for example, without the use of avoidant coping allows for the development of greater awareness and insight. This is because the individual becomes less crippled by the emotional distress associated with being 'fused with' and 'believing' the thought without question. These approaches clearly fit well with cognitive maintenance models that link experiential avoidance with distress.

Haddock *et al.* (1998) compared two interventions for coping with auditory hallucinations. One intervention was a 20 session programme focusing on the use of distraction as a coping strategy. The other was a 20 session programme on the use of focusing as a coping strategy. At the end of treatment, a significant increase in self esteem was observed for the focusing group and a significant decrease in self esteem was observed for the distracting group. After 2 years follow up, both groups showed a reduction in self esteem in comparison to their scores at the end of treatment. In addition to the reduction in self esteem, in support of Morrison's (2001) maintenance model, Haddock's focusers reported stronger beliefs that their voices were their own thoughts.

Crumlish *et al.* (2005) followed 101 individuals for four years from when they initially presented to services experiencing psychosis. They also reported negative outcomes associated with insight. They found that greater acknowledgement of mental illness six months after presentation increased depression scores and the likelihood that the participant had attempted suicide four years after presentation.

Proposed method of analysis

Birchwood, Meaden, Trower, Gilbert and Plaistow (2000) showed that individuals who perceived their voices as being more powerful than them also perceived themselves as having lower social ranking and less power than significant others in their lives. Similarly, Gilbert *et al.* (2001) showed that perceptions of inferiority in relation to voices were replicated in real life relationships. Birchwood *et al.* (2004) described these internal and external relating patterns as stemming from an individual's experiences of early relationships which had been internalised to form interpersonal schemata. They used covariance structural equation modeling (SEM) to test the relationships between perception of social rank, voice power appraisals, and distress. They found that the model that fitted their data best started with social rank perception and that this predicted appraisals of voice power and distress. The competing models that accounted for less variance tested depression and voice appraisals as alternative primary predicting factors.

SEM was deemed the best method of analysis for the present study because complicated relationship patterns, like those tested by Birchwood *et al.*, could be explored. The present study proposed four hypotheses that described mediating or moderating effects of appraisals and coping within the proposed relationship between trauma and wellbeing.

Hypotheses

Model 1 predicted that personalising appraisals as a result of trauma prevent the use of interpersonal coping - and that this has a negative effect on wellbeing.

Model 2 predicted that danger to self appraisals as a result of trauma prevent acceptance based coping – and that this has a negative effect on wellbeing.

Model 3 predicted that interpersonal coping and acceptance based coping facilitate psychological explanations of auditory hallucinations – and that this has a positive effect on wellbeing.

Model 4 predicted that interpersonal coping and acceptance based coping facilitate appraisals of experiences as a manifestation of normal human experience – and that this has a positive effect on wellbeing.

Method

Sample

The study recruited 62 voice hearing participants. Each of these participants agreed with a statement that said they ‘had heard voices or noises that other people could not hear within the last three months’ before completing the questionnaires. There were 20 males, 38 females and 4 participants who did not disclose their gender. Participant age ranged between 15 and 72. They were asked to indicate whether they had been given a diagnosis in relation to hearing voices or sounds and the age at which they had received it. As would be expected, the most common age bracket for receiving a diagnosis was 15-25. One participant had received a diagnosis at age 12 and the oldest age given for diagnosis was 47. A number of participants also reported comorbid diagnoses. These included depression, anxiety, bipolar disorders, personality disorders and dissociative disorders. A breakdown of the main, voice hearing related diagnoses identified by the participants are shown below in Table 1.

Table 1: Participants by primary diagnosis identified

Diagnosis	Number of participants
Schizophrenia	22
No diagnosis	13
Schizoaffective	8
Psychosis	5
Psychotic depression	2
PTSD	1
Missing	10

Design

The study used a cross sectional design. All 62 voice hearing participants completed all of the measures. When descriptive statistics were calculated, participants were separated into two groups according to whether they had experienced trauma or not.

Procedure

The clinical sample was recruited by mixed methods. Adverts for the study were posted on the following schizophrenia and psychosis support forums: Schizophrenia.com, Schizophreniaforums.com, MDjunction.com, Mytherapy.com, Ehealthforum.com,

Topix.com, and Social-medicine.org. Adverts were posted on Twitter and Tumblr with the keywords: schizophrenia, psychosis, hearing voices and auditory hallucinations. An advert was also posted as a public message via Yahoo questions. Some individuals on Tumblr and Social-medicine.org who had identified themselves as experiencing auditory hallucinations were emailed an advert directly.

Twelve of the clinical participants were recruited via four Hearing Voices Groups in the UK. An email advertising the project was sent to all Hearing Voices group leaders using an email distribution list provided by the Hearing Voices network and contact details provided on the Hearing Voices website.

Ethics and consent form

Ethical approval for the study was gained from the University of Edinburgh's ethics board. It was made clear to participants on the consent form that they could miss out any items they did not feel comfortable with and that they could decide to stop at any time. Consent forms were gathered and kept separately from the completed questionnaires to maintain participant anonymity.

Measures

All participants were asked to input their age, gender, any diagnosis they had received related to hearing voices, the age they received it and what support they were accessing at the time of participation. Each participant was then asked to complete the following questionnaires:

Adapted Interpretations of Voices Inventory (AIVI) (Journal Article 1)

Subscales: normalising, personalising

The Interpretations of Voices Inventory (IVI) (Morrison *et al.*, 2002) is a 26 item self report questionnaire developed to measure appraisals of auditory hallucinations. The adaptation of the IVI is described in Journal Article 1). The inventory originally measured personalising, metaphysical, loss of control and positive appraisals of voices. The positive appraisal items were replaced with normalising items. Acceptable factor structures were reported for the measure using a clinical sample of 120 participants.

Brief COPE (Carver, 1997)

Subscales: avoidant coping, interpersonal coping, acceptance

The Brief COPE (Carver, 1997) is a 28 item self report questionnaire developed to measure a broad range of coping strategies to cope with a specified problem or situation. It was

selected because it measured avoidant coping, interpersonal coping and acceptance based coping in the form of one brief questionnaire. Carver reported strong correlations between paired items designed to measure different constructs. Because of this, he explicitly instructed the user of the Brief COPE that inclusion of the full range of paired items was not essential. The items from the Brief COPE that were chosen to measure these factors are shown in Appendix A.

BBC Wellbeing Scale (Kinderman, Schwannauer, Pontin & Tai, 2011)

Subscales: psychological, relationship, physical

The BBC well-being scale is a 31 item questionnaire that was developed to measure a broad range of aspects of personal wellbeing. It was chosen so that the impact of appraisals and coping on multiple facets of wellbeing could be explored. When tested with a population sample of 1,940 it demonstrated high levels of internal consistency as a single factor ($\alpha=.94$) and also among its three subscales: psychological well-being, physical health and well-being and relationships ($\alpha=0.93$, $\alpha=0.88$, $\alpha=0.79$ respectively). Among other measures, Goldberg scales of anxiety and depression, a self report measure of adverse experiences in childhood, a list of threatening experiences measure and self blame on an attributions questionnaire correlated with all of the subscales (Kinderman *et al.*, 2011).

Adverse Childhood Experiences Questionnaire (ACE) (Felitti *et al.*, 1998)

Subscales: Emotional abuse, physical abuse, sexual abuse, physical neglect, emotional neglect

The Adverse Childhood Experiences Questionnaire is a 10 item self report questionnaire that was developed by combining items from the Childhood Trauma Questionnaire (Bernstein *et al.*, 1994), Conflict Tactics Scales (Strauss & Gelles, 1990), and sexual abuse questions used by Wyatt (1985). Wingenfeld *et al.* (2011) tested the German version of the questionnaire with psychosomatic inpatients and adults from the general population. They found that the internal consistency of the ACE was satisfying and that it correlated highly with scores from the Childhood Trauma Questionnaire.

Whitfield, Dube, Felitti and Anda (2005) used the ACE measure to explore the relationship between childhood experience of trauma and hallucinations in a large population study. They found that the risk of hallucination was increased 1.2 to 2.5 fold by any ACE, regardless of the category. They reported a significant and graded relationship between ACE score and history of hallucination that was independent of a history of substance abuse.

Results

Distributions

Adapted IVI factor scores

Mean scores were calculated for the personalising, danger to self and normalising factors . For each of the factors, both the skewness and kurtosis statistics were calculated as less than double the standard error. These results suggested that the assumption of normality should not be rejected. Because the sample was greater than 50, the Kolmogorov-Smirnov test was also used to further test the factor distributions. All of the factor distributions were indicated as being significantly different from an assumed normal distribution. Square root and logarithmic conversion methods did not sufficiently correct this.

On looking at the distributions using histograms and boxplots, it could be seen that the skew in each of the distributions was caused by the majority of participants endorsing the least clinical response. The rates of endorsement of items and factors then declined to form a slope so that the smallest number of respondents endorsed the most clinical response.

It was concluded that the distributions had been impacted by the narrow four point Likert scale that had been used and the very specific population that had been consulted. As identified, the factors evoked strong majority responses and small numbers deviated from this. This resulted in the distributions appearing as either the bottom half or the top half of the normal curve. It was concluded that this deviation from normality was to be expected from the questions that were asked and were in fact felt to be indicative of validity.

It was concluded that the normality test results indicated that the scores were on the cusp of normality and provided enough justification to proceed to using structural equation modeling. This was decided because structural equation modeling using the maximum likelihood estimator has been shown to be robust in its use with non normal distributions (Hu & Bentler, 1998).

Brief Cope factor scores

Mean scores were calculated for the interpersonal, avoidance and acceptance factors. For each of the factors, both the skewness and kurtosis statistics were calculated as less than double the standard error. These results suggested that the assumption of normality should not be rejected. The acceptance factor was the only factor that was not indicated to be significantly different for an assumed normal distribution by the Kolmogorov-Smirnov test.

Square root and logarithmic conversions methods did not sufficiently correct this distribution.

As with the IVI factors, it could be seen that the skew in the distributions was caused by the majority of participants endorsing the least clinical response. The rates of endorsement of items and factors then declined to form a slope so that the smallest number of respondents endorsed the most clinical response.

The authors concluded that the distributions had been impacted by the narrow four point Likert scale that had been used and the very specific population that had been consulted. As identified, the factors evoked strong majority responses and small numbers deviated from this. This resulted in the distributions appearing as either the bottom half or the top half of the normal curve. It was concluded that this deviation from normality was to be expected from the questions that were asked and were in fact felt to be indicative of validity.

It was concluded that the normality test results indicated that the scores were on the cusp of normality and provided enough justification to proceed to using structural equation modeling. This was decided because structural equation modeling has been shown to overcome distribution problems like these (Hu & Bentler, 1998).

BBC Wellbeing factor scores

Mean scores were calculated for overall wellbeing. Both the skewness and kurtosis statistics were calculated as less than double the standard error. These results suggested that the assumption of normality should not be rejected. The Kolmogorov-Smirnov test also indicated that the distribution was not significantly different from an assumed normal distribution. On looking at the distribution using histograms and boxplots, the factor appeared to be normally distributed.

Missing data

A weakness of the data set was that missing data was calculated as contributing to less than 5% on all items with the exception of the coping measure. Missing values for the coping measure accounted for up to 12% of the data set. Little's (1988) Missing Completely at Random test for each item was non significant with the exception of the items from the coping measure. This indicated that the data was missing completely at random with the exception of the data for the coping measure.

Full information maximum likelihood was used to handle the missing data across the whole sample. Schlomer, Bauman and Card (2010) showed using a simulation that FIML generated acceptable estimations of regression coefficients and standard errors across both types of missing data (MCAR and MAR) as well as across 10% and 20% missing data.

Description of sample

Participants reported high levels of trauma, rates for each type of trauma measured are shown below in Table 2.

Table 2: Participant experiences of trauma

Interpersonal trauma (Before age 16)	Yes (%)	No (%)	Total	Missing
Any type of trauma reported	42 (68%)	15 (24%)	57	5
Emotional abuse	35 (57%)	22 (36%)	57	5
Physical abuse	25 (40%)	32 (52%)	57	5
Sexual abuse	17 (27%)	40 (65%)	57	5
Emotional neglect	31 (50%)	26 (42%)	57	5
Physical neglect	10 (16%)	47 (76%)	57	5

The participants' scores on the BBC wellbeing measure are shown in Table 3 in comparison with scores reported by Kinderman *et al.* (2011) from their validation of the measure with a general population sample of 1,940.

Table 3: Participant wellbeing scores

	Total wellbeing scale	Psychological wellbeing	Physical health and wellbeing	Relationships wellbeing
Kinderman et al. mean scores from general population	54.56	39.24	28.75	11.37
Trauma means (SD)	30.58 (15.82)	15.41 (9.88)	9.26 (5.36)	6.62 (4.38)
N	33	37	39	37
No trauma means (SD)	41.09 (14.90)	19.85 (8.57)	13.42 (5.20)	9.31 (3.75)
N	11	13	12	13

As predicted, participants reporting childhood interpersonal trauma scored lower on all measures of wellbeing than the general population scores provided by Kinderman *et al.* It was interesting that the participants not reporting childhood interpersonal trauma also scored lower on all measures of wellbeing than the general population scores provided by Kinderman *et al.*

A one-way ANOVA was used to determine whether there were any statistically significant differences between the two groups of participants (trauma versus no trauma) on the wellbeing scores. Levene's statistic indicated that the variance between the groups was homogenous for each of the tests. This was important because the number of participants in each group was different. It should be noted that a t-test could also have been used in this instance. When used to compare two groups, the ANOVA's F test is statistically identical to a t-test.

A significant difference was reported between these groups for physical health and wellbeing ($F(1,49) = 5.605, p = .022$). A significant difference was not reported between these groups for total wellbeing scores ($F(1,42) = 3.745, p = .060$) or relationships wellbeing ($F(1,48) = 3.876, p = .055$). However, these differences could be classified as trends. A significant difference was not reported between these groups for psychological wellbeing ($F(1,48) = 2.071, p = .157$).

Analysis

Structural Equation Modeling

The statistical package, MPlus version 5, was used to conduct covariance Structural Equation Modeling (SEM) to test models constructed from the hypothesised relationships between the measures. Maximum Likelihood estimation of the models was used.

Although the chi square has many problems associated with it, it is still essential that it is always reported alongside degrees of freedom and associated p value (Kline, 2005). Hu and Bentler (1999) examined cut offs for many of the other indices. They recommended that a combination of one of the relative fit indexes and the SRMR (good models < .08) or the RMSEA (good models < .06) should be reported. Similarly Kline recommended reporting chi square, the RMSEA, the CFI and the SRMR.

It should be noted that there has been debate about how strictly fit index 'rules of thumb' should be adhered to. It is generally agreed (to varying extents) that cut off values can lead to instances of Type I error and that some flexibility may be considered in circumstances where it can be justified theoretically (Marsh et al, 2004).

The avoidance coping factor

The avoidance coping items did not covary successfully to form a robust factor. This prevented model convergence and therefore resulted in the removal of 'avoidance' from any of the hypothesised models. It was the original intention of the study to test whether 'self blame' and 'danger to self' appraisals predicted the use of avoidance coping. Unfortunately it was not possible to test this.

Hypothesised models

The hypothesised models involved the use of two observed variables (interpersonal trauma in childhood and wellbeing). They involved the use of six latent variables (personalising appraisals, danger to self appraisals, normalising (psychological) appraisals, normalising (human experience) appraisals, interpersonal coping and acceptance based coping. The items that were used to form these latent variables are presented in Appendix B.

Model 1 predicted that personalising appraisals as a result of trauma prevent the use of interpersonal coping - and that this would have a negative effect on wellbeing.

Model 2 predicted that danger to self appraisals as a result of trauma prevent acceptance based coping – and that this would have a negative effect on wellbeing.

Model 3 predicted that interpersonal coping and acceptance based coping facilitate psychological explanations of auditory hallucinations – and that this would have a positive effect on wellbeing.

Model 4 predicted that interpersonal coping and acceptance based coping facilitate the view that auditory hallucinations lie on a continuum of normal human experience – and that this would have a positive effect of wellbeing.

These models were tested against alternative models that were also considered to be theoretically sound. The hypothesised models depicted the most parsimonious way that the predicted relationships could be mapped. The alternative models involved more complex interactions between the variables.

Structural Equation Modeling results

The reporting of these results was informed by reported in was informed by Schreiber, Nora, Stage, Barlow and King's (2006) recommendations. All of the models that were tested and their corresponding fit statistics are presented in Appendices C, D, E and F.

From the hypothesised models, Model 1 predicted that personalising appraisals as a result of trauma would prevent the use of interpersonal coping - and that this would have a negative effect on wellbeing.

Model 2 predicted that danger to self appraisals as a result of trauma would prevent acceptance based coping – and that this would have a negative effect on wellbeing.

Model 3 predicted that interpersonal coping and acceptance based coping would facilitate psychological explanations of auditory hallucinations – and that this would have a positive effect on wellbeing.

Model 4 predicted that interpersonal coping and acceptance based coping would facilitate the view that auditory hallucinations lie on a continuum of normal human experience – and that this would have a positive effect of wellbeing.

Figure 1: Best fitting danger to self/acceptance model

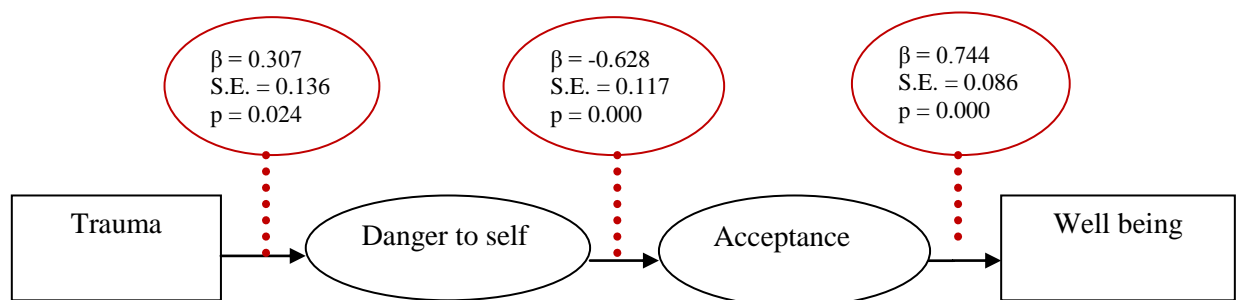


Figure 1 shows that participants' trauma scores shared 31% of their variance with 'danger to self' appraisals. Danger to self appraisals inversely shared 63% of their variance with acceptance scores; acceptance scores shared 75% of their variance with wellbeing scores. All of these relationships were reported as significant to the $p < 0.05$ level.

Figure 2: Best fitting normalising (psychological) model

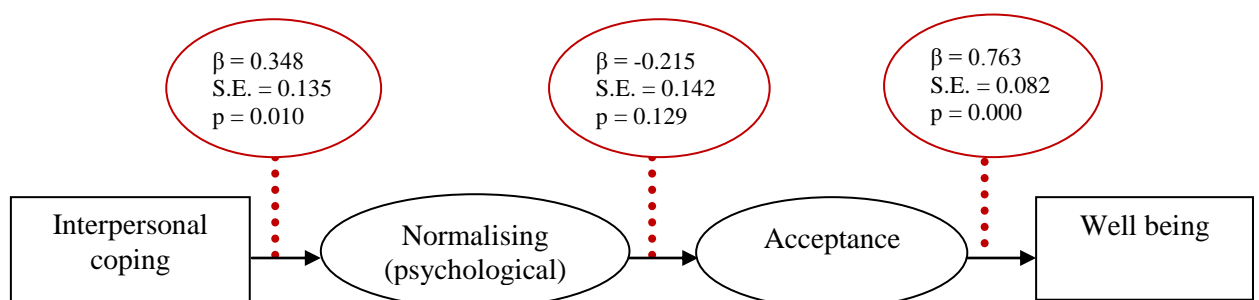


Figure 2 shows that interpersonal coping shared 35% of its variance with normalising (psychological) appraisals. Normalising (psychological) appraisals inversely shared 22% of its variance with acceptance scores; acceptance scores shared 76% of their variance with wellbeing scores. The relationship between interpersonal coping and normalising

(psychological) appraisals was significant to the <0.05 level. The relationship between acceptance based coping and wellbeing was also significant to the $p \leq 0.05$ level. The relationship between normalising (psychological) appraisals and acceptance based coping was non significant.

In order to further develop the model, this non significant relationship was removed from the model. Figure 3 shows the adapted model that was subsequently tested.

Figure 3: Adapted normalising (psychological) model

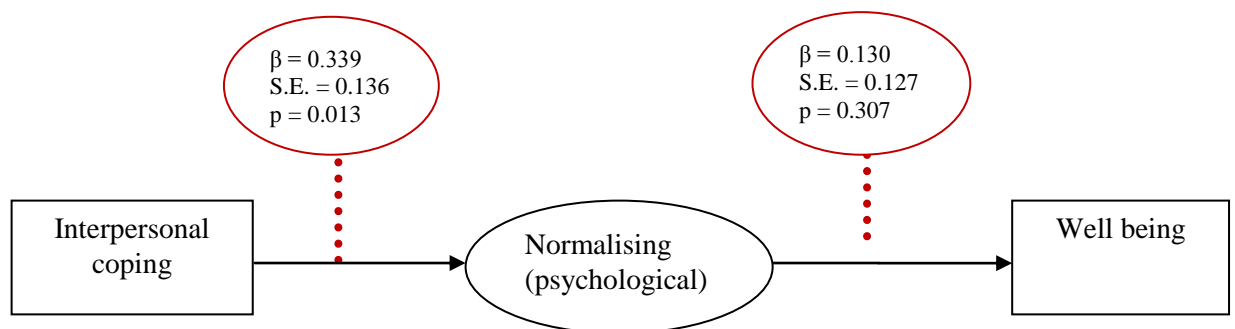


Figure 3 shows that interpersonal coping shared 34% of its variance with normalising (psychological) appraisals. Normalising (psychological) appraisal scores shared 13% of their variance with wellbeing scores. The relationship between interpersonal coping and normalising (psychological) appraisals was significant to the $p < 0.05$ level. The relationship between normalising (psychological) appraisals and wellbeing was non significant.

With the non significant relationship removed, this adapted model fitted the data better but did not generate any new significant relationships.

Discussion

Results and relevant literature

The strongest relationship reported by the study was that acceptance based coping significantly predicted wellbeing in both of the models that fitted the data. These two factors shared 75% and 76% of their variance. Appraisals relating to a sense of danger to self inversely shared 63% variance with acceptance. These high rates of shared variance suggest that acceptance might mediate the relationship between danger to self and wellbeing.

Soppitt and Birchwood (1997) reflected that negative appraisals of voices could cause low mood, but equally that low mood could generate negative voices. This illustrates an alternative explanation for these relationships; it is conceivable that negative voices would elicit stronger ‘danger to self’ appraisals and that this would inhibit acceptance.

Dangers to self appraisals were significantly predicted by trauma severity (number of types of interpersonal trauma exposed to in childhood). However, only 31% variance was shared. This suggests that other factors may play a greater role in predicting danger to self than trauma. Alternatively, some types of trauma that were measured may have predicted danger to self more than others. Bentall *et al.*’s differentiation between the psychological effects of sexual abuse and other types of victimisation would support this possibility.

In a separate model, interpersonal coping significantly predicted psychological explanations for auditory hallucinations. The items measuring psychological normalising referred to tiredness, stress and illness. Conceptually, the illness item could be likened to a measure of insight. This finding supports White *et al.*’s. (2000) hypothesis that social isolation reduces an individual’s access to alternative and normalising explanations and that this impairs their ability to relabel psychotic experiences. It also supports Lysaker *et al.*’s (1998) competing proposal; that social isolation occurs as a result of decreased insight.

Kingdon and Turkington (1991) described the use of a destigmatising, normalising rationale to explain symptom emergence and management to clients. Their results suggested that these methods resulted in reduced levels of symptomatology, hospitalisations and improved social adjustment. The present study hypothesised that psychological explanations for auditory hallucinations would facilitate acceptance (and therefore wellbeing). Interestingly, psychological explanations and acceptance were inversely but non significantly related.

Cooke *et al.* (2007) reported that a social support seeking coping style correlated with greater awareness of illness. However, they also reported that awareness of symptoms correlated with greater distress. It is possible that the inverse (non significant) relationship between psychological explanations and acceptance illustrates that awareness is not necessarily accompanied by heightened wellbeing. Haddock *et al.*'s (1998) report of participants from the focusing group who reported stronger beliefs that their voices were their own thoughts but did not report any associated improvements in self esteem would support this.

Non significant results

None of the self blame (personalising) models fitted the data set acceptably. Bentall *et al.*'s proposed difference between the psychological consequences of sexual abuse and other types of victimisation provides a possible explanation for this result. The rates among the sample for each of the subtypes of interpersonal trauma showed that emotional abuse, emotional neglect and physical abuse were reported at almost double the rate of sexual abuse. Maybe the model would have fitted the data if only people who had experienced sexual abuse had participated in the study.

The rationale for interpersonal coping predicting human experience explanations was that talking about auditory hallucinations with others would elicit normalising responses. It was predicted that descriptions of unusual experiences by other people would facilitate a view of auditory hallucinations as a 'normal' phenomenon. This effect of normalising is utilised by Kingdon and Turkington. However, it is likely that people receive more unsupportive responses to attempts of talking about their hallucinations than supportive responses. It is also possible that stigma and fear of negative reactions has prevented participants from even attempting to talk about their experiences. These experiences could reinforce any trauma related negative beliefs about self and others and reinforce the use of avoidant coping.

The non significant relationships between normalising (psychological) appraisals and acceptance and wellbeing scores were not predicted by the study. However, these results reflect Haddock *et al.*'s (1998) and Crumlish *et al.*'s (2005) findings that linked insight with negative and depression related outcomes.

Conclusion

The results of this study provide tentative evidence for the link between trauma in childhood and the experience of auditory hallucinations as dangerous. This appears to limit acceptance

based coping and hamper wellbeing. These significant effects raise the question of whether acceptance based interventions can reduce danger to self appraisals.

Acceptance based approaches propose that learning to mindfully observe negative thoughts and assumptions limits emotional distress associated with being ‘fused with’ and ‘believing’ them without question. This fits well with the cognitive maintenance model for auditory hallucinations that links experiential avoidance with distress.

The reported relationship between interpersonal coping and psychological explanations has highlighted interesting questions relating to potential costs and benefits associated with insight.

Limitations associated with the study

The small sample size, significant percentage of missing values and distribution of questionable normality limit the validity of these results. Because the majority of respondents participated online, the description of the sample was limited. Participants from different countries were thought to have participated but details of this were not gathered. It is possible that the psychological mechanisms that were tested vary across cultures.

The latent factors that were used in the analysis were constructed using very small numbers of items. Although this may have encouraged participation, it would be helpful if the reported effects were explored with better validated measures with more items that measure the concepts more broadly. The Voice Acceptance and Action Scale (VAAS; Shawyer *et al.*, 2007), for example, could be used as a broader, better validated measure of voice acceptance.

Future directions

The exploration of psychological mechanisms that mediate or moderate the relationship between trauma and voice related distress may be clinically valuable. It is hoped that this study has demonstrated a method of exploring potential psychological mechanisms that can be replicated with better measures and a larger sample size. Analysis could be enhanced by testing for and differentiating mediation and moderation effects.

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Appendix A: Brief COPE factors

Items used from Brief COPE to create factors used by the study. The avoidance items did not covary enough to form an acceptable factor.

Table A1: Brief COPE factors

Avoidant coping	Original factor from Brief COPE
1) I've been turning to work or other activities to take my mind off things.	Self distraction
3) I've been using alcohol or other drugs to make myself feel better.	Substance use
8) I've been using alcohol or other drugs to help me get through it.	Substance use
15) I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	Self distraction

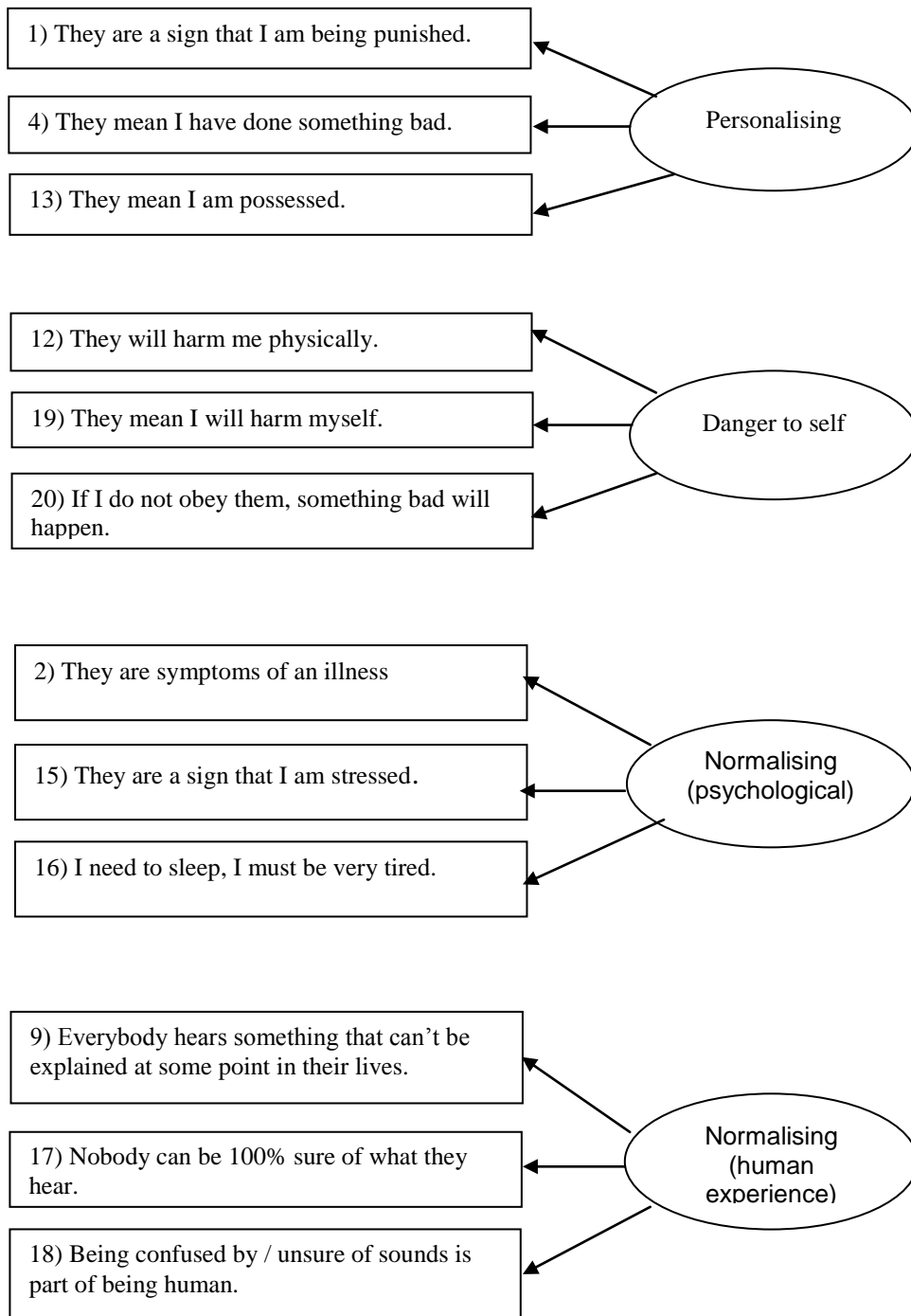
Interpersonal coping	Original factor from Brief COPE
4) I've been getting emotional support from others.	Emotional support
7) I've been getting help and advice from other people.	Instrumental support
11) I've been getting comfort and understanding from someone.	Emotional support
17) I've been trying to get advice or help from other people about what to do.	Instrumental support

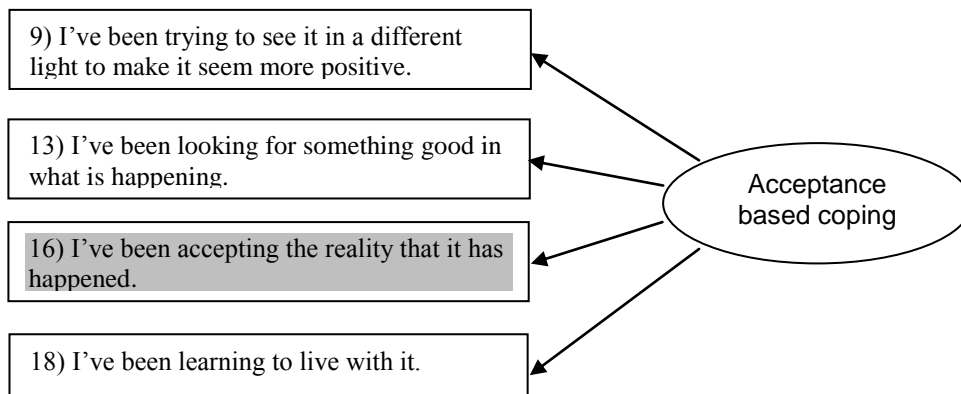
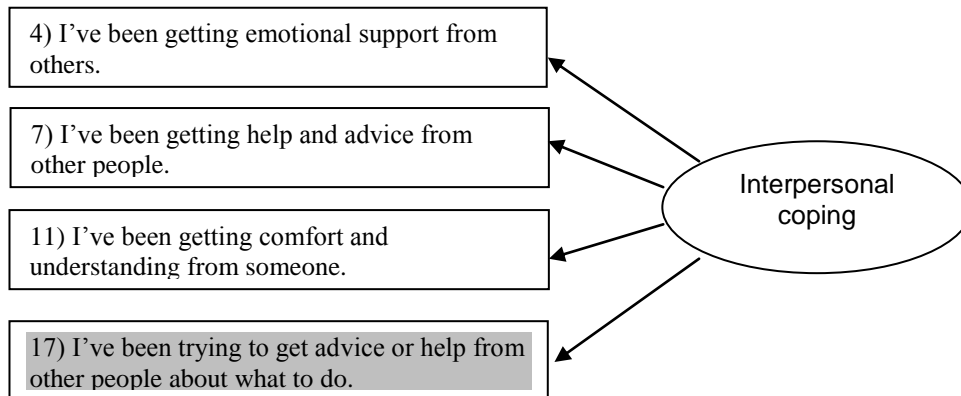
Acceptance based coping	Original factor from Brief COPE
9) I've been trying to see it in a different light to make it seem more positive.	Positive reframing
13) I've been looking for something good in what is happening.	Positive reframing
16) I've been accepting the reality that it has happened.	Acceptance
18) I've been learning to live with it.	Acceptance

Appendix B: Latent variable construction

Figure B1: Latent variable construction

The figures below show which questionnaire items were used to create the latent variables. Items 17 and 16 (marked in grey) were removed to improve the fit of the measurement models. Item 7 was included in the normalising (psychological) factor because it improved the fit of the measurement model.





Appendix C: Model 1

Model 1: Personalising/interpersonal models

Model A predicted that personalising appraisals as a result of trauma would prevent the use of interpersonal coping - and that this would have a negative effect on wellbeing.

Model B predicted that there would be an independent relationship between trauma and wellbeing. It predicted that personalising appraisals would moderate this relationship. It was predicted that interpersonal coping would inversely correlate with personalising appraisals. Interpersonal coping was not predicted to moderate between trauma and wellbeing.

Model C predicted that there would be an independent relationship between trauma and wellbeing. It predicted that interpersonal coping would moderate this relationship. It was predicted that personalising appraisals would inversely correlate with interpersonal coping. Personalising appraisals were not predicted to moderate between trauma and wellbeing.

These models are presented visually in the figures below. The fit statistics for each of these models are presented in Table C1.

Figure C1: Model A

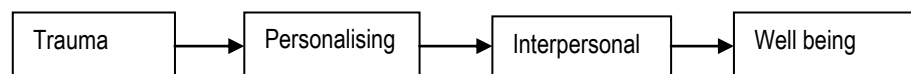


Figure C2: Model B

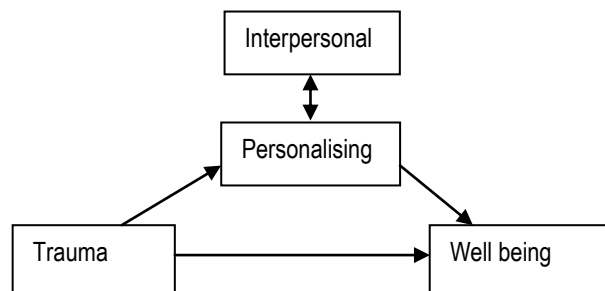


Figure C3: Model C

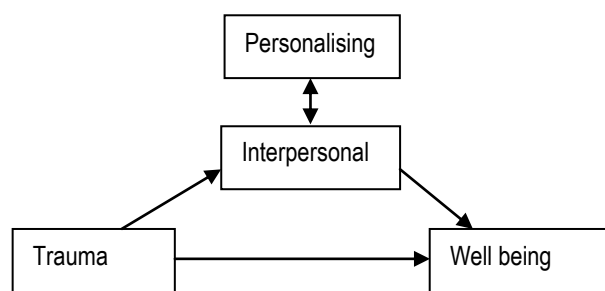


Table C1: Fit statistics

Model	χ^2 (df)	p	RMSEA	SRMR	CFI
Recommended cut off	χ^2 /df within range of 2 - 5	Non sig >0.05	<0.06	<0.08	>0.95
Measurement model	12.238 (8)	0.1409	0.093	0.097	0.963
Model A	33.641(19)	0.0203	0.116	0.097	0.887
Model B	33.754 (18)	0.0135	0.124	0.101	0.879
Model C	36.621 (18)	0.0059	0.135	0.110	0.857

None of the models that were tested, with the exception of the measurement model, fitted the data well enough to be reported on. All the fit statistics reported were out with the recommended cut off limits.

Appendix D: Model 2

Model 2: Danger to self/acceptance models

Model A predicted that ‘danger to self’ appraisals as a result of trauma would prevent acceptance based coping – and that this would have a negative effect on wellbeing.

Model B predicted that there would be an independent relationship between trauma and wellbeing. It predicted that ‘danger to self’ appraisals would moderate this relationship. It was predicted that acceptance based coping would inversely correlate with ‘danger to self’ appraisals. Acceptance based coping was not predicted to moderate between trauma and wellbeing.

Model C predicted that there would be an independent relationship between trauma and wellbeing. It predicted that acceptance based coping would moderate this relationship. It was predicted that ‘danger to self’ appraisals would inversely correlate with acceptance based coping. ‘Danger to self’ appraisals were not predicted to moderate trauma and wellbeing.

These models are presented visually in the figures below. The fit statistics for each of these models are presented in Table D1.

Figure D1: Model A

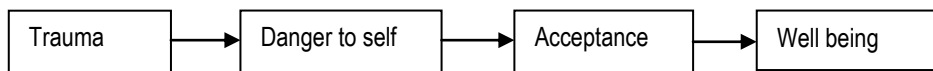


Figure D2: Model B

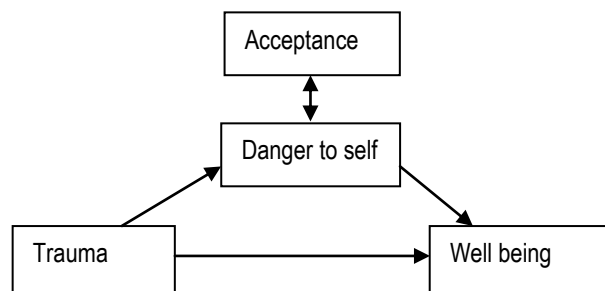


Figure D3: Model C

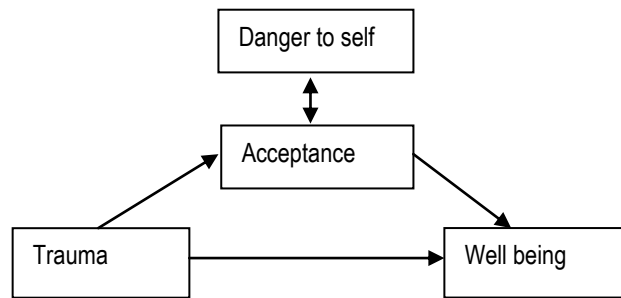


Table D1: Fit statistics

Model	$X^2(df)$	p	RMSEA	SRMR	CFI
Recommended cut off	X^2/df within range of 2 - 5	Non sig >0.05	<0.06	<0.08	>0.95
Measurement model	11.602 (8)	0.1698	0.086	0.039	0.968
Model A	25.474 (19)	0.1455	0.077	0.063	0.955
Model B	31.841 (18)	0.0230	0.116	0.078	0.904
Model C	24.494 (18)	0.1395	0.080	0.090	0.955

Models A and C both fitted the data adequately according to the CFI and p values. They both had a lower x^2/df ratio than model B. None of the models (including the measurement model) were calculated as having RMSEA scores below the recommended cut off limit. Interestingly, according to the SRMR score, models A and B were recommended as alternative fits to the measurement model. Model A was deemed the best fit due to its lower x^2/df ratio, higher p value and lower RMSEA and SRMR statistics.

Standardised regression coefficients

When looking at the path coefficients for model A, danger to self was predicted by trauma (0.307, $p=0.024$). Acceptance was predicted by danger to self (-0.628, $p=0.000$) and as was reported for model 1, wellbeing was predicted by acceptance (0.744, $p=0.000$).

When looking at the path coefficients for model C, mean trauma score did not predict acceptance (0.226, $p=0.072$). However, acceptance predicted wellbeing (0.774, $p=0.000$) and acceptance and danger to self correlated (-0.670, $p=0.000$). Wellbeing was predicted by trauma (-0.217, $p=0.045$).

Appendix E: Model 3

Model 3: Normalising (psychological) models

Model A predicted that interpersonal coping would facilitate normalising (psychological) explanations. It was predicted that these explanations would facilitate acceptance and that acceptance would predict wellbeing.

Model B predicted that interpersonal and acceptance based coping would both predict wellbeing and normalising (psychological) explanations.

Model C predicted that interpersonal and acceptance based coping would both facilitate normalising (psychological) explanations of auditory hallucinations. It was proposed that psychological explanations would predict wellbeing.

These models are presented visually in the figures below. The fit statistics for each of these models are presented in Table E1.

Figure E1: Model A

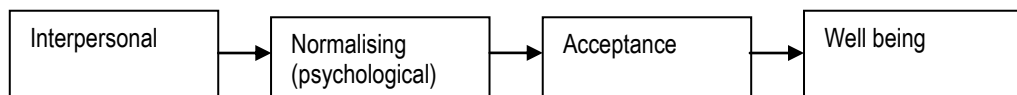


Figure E2: Model B

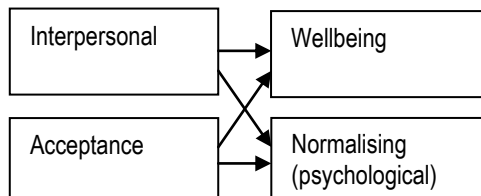


Figure E3: Model C

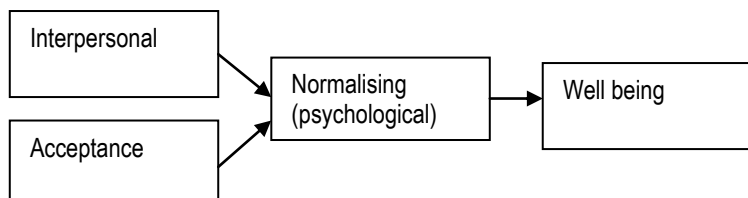


Table E1: Fit statistics

Model	X ² (df)	p	RMSEA	SRMR	CFI
Recommended cut off	X ² /df within range of 2 - 5	Non sig >0.05	<0.06	<0.08	>0.95
Measurement model	24.896 (24)	0.4114	0.025	0.065	0.994
Model A	36.806 (33)	0.2970	0.043	0.068	0.979
Model B	35.888 (30)	0.2118	0.056	0.067	0.967
Model C	65.684 (32)	0.0004	0.130	0.133	0.812

Models A and B both fitted the data adequately according to all of the fit indices that were reported. Model A was deemed the best fit due to its lower χ^2/df ratio, higher CFI and p value and lower RMSEA statistics. It was interesting that Model B's SRMR statistic was marginally lower than model A's.

Standardised regression coefficients

When looking at the path coefficients for model A, normalising (psychological) was predicted by interpersonal coping (0.348, $p=0.010$). Acceptance was not predicted by normalising (psychological) appraisals (0.215, $p=0.129$). Wellbeing was predicted by acceptance (0.763, $p=0.000$).

When looking at the path coefficients for model B, normalising (psychological) was predicted by interpersonal coping (0.343, $p=0.010$) but not predicted by acceptance (0.216, $p=0.139$). Wellbeing was predicted by acceptance (0.762, $p=0.000$) but not predicted by interpersonal coping (0.062, $p=0.593$).

Figure E4: Model A adapted

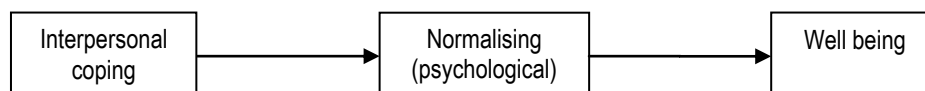


Table E2: Fit statistics for adapted Model A

Model	X ² (df)	p	RMSEA	SRMR	CFI
Recommended cut off	X ² /df within range of 2 - 5	Non sig >0.05	<0.06	<0.08	>0.95
Measurement model	2.913 (8)	0.9397	0.000	0.040	1.000
Model A	36.806 (33)	0.2970	0.043	0.068	0.979
Adapted model A	11.945 (13)	0.5322	0.000	0.056	1.000

Adapted model A fitted the data adequately according to all of the fit indices that were reported. The table above shows that the adapted model was a better fit than the original model due to its lower x^2/df ratio, higher CFI and p value and lower RMSEA statistics.

Standardised regression coefficients

When looking at the path coefficients for the adapted model, normalising (psychological) was predicted by interpersonal coping (0.339, $p=0.013$). Wellbeing was not predicted by normalising (psychological) appraisals (0.130, $p=0.307$).

Appendix F: Model 4

Normalising (human experience) models

Model A predicted that interpersonal coping and acceptance based coping facilitate the view that auditory hallucinations lie on a continuum of normal human experience – and that this has a positive effect of wellbeing.

Model B predicted that interpersonal and acceptance based coping would both facilitate normalising (human experience) explanations of auditory hallucinations. It was proposed that psychological explanations would predict wellbeing.

Model C predicted that interpersonal and acceptance based coping would both predict wellbeing and normalising (human experience) explanations.

These models are presented visually in the figures below. The fit statistics for each of these models are presented in Table F1.

Figure F1: Model A

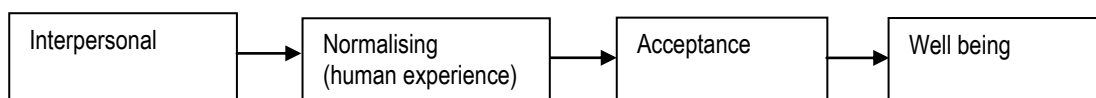


Figure F2: Model B

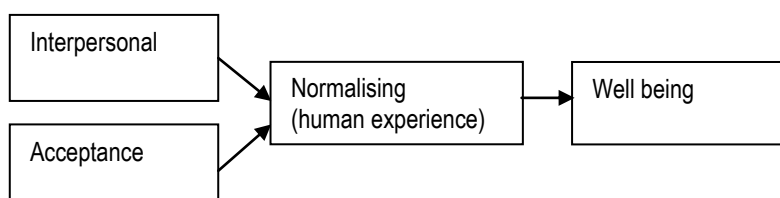


Figure F3: Model C

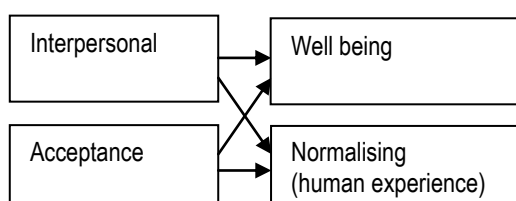


Table F1: Fit statistics

Model	$X^2(df)$	p	RMSEA	SRMR	CFI
Recommended cut off	X^2/df within range of 2 - 5	Non sig >0.05	<0.06	<0.08	>0.95
Measurement model	33.803 (24)	0.0882	0.082	0.073	0.939
Model A	50.521 (33)	0.0261	0.093	0.081	0.911
Model B	68.988 (32)	0.0002	0.137	0.108	0.812
Model C	49.841 (30)	0.0129	0.103	0.080	0.899

None of the models, with the exception of the measurement model, fitted the data well enough to be reported on. All fit statistics were out with the recommended cut off limits.

Appendix G: Final version of the Adapted IVI

The experience of hearing sounds and voices when there is nothing there to explain it is a common one. It is particularly common when under stress, falling asleep or waking up. Listed below are a number of attitudes and thoughts that people have expressed about hearing unexpected sounds or voices. There are no right or wrong answers. Please give a response about how you generally feel.

Please read each statement and then circle the number which corresponds to how much you believe this. Please give a response to all the statements.

If I were to hear sounds or voices that other people could not hear, I would probably think that....	Not at all	Some what	Moderately so	Very much
They are a sign that I am being punished.	1	2	3	4
They are symptoms of an illness.	1	2	3	4
They would make me harm someone.	1	2	3	4
They mean I have done something bad.	1	2	3	4
They mean that I am close to God.	1	2	3	4
They mean I will do bad things.	1	2	3	4
They are one or more parts of my personality.	1	2	3	4
They mean that I have been chosen.	1	2	3	4
Everybody hears something that can't be explained at some point in their lives.	1	2	3	4
They have come from the spiritual world.	1	2	3	4
They are a sign that I am evil.	1	2	3	4
They will harm me physically.	1	2	3	4
They mean I am possessed.	1	2	3	4
They have to be obeyed.	1	2	3	4
They are a sign that I am stressed.	1	2	3	4
I need to sleep, I must be very tired.	1	2	3	4
Nobody can be 100% sure of what they hear.	1	2	3	4
Being confused by / unsure of sounds is part of being human.	1	2	3	4
They mean I will harm myself.	1	2	3	4
If I do not obey them, something bad will happen.	1	2	3	4
They mean I am a bad person.	1	2	3	4

Personalising items: 1, 4, 13
Danger to self items: 12, 19, 20

Normalising (psychological) items: 2, 15, 16
Normalising (human experience) items: 9, 17, 18

COMMENTS BY PARTICIPANTS

Participants were invited to write a comment at the end of the questionnaire pack if they wished. Out of the 113 participants, 45 left a comment. These comments were put into themes that were felt to be relevant to the study.

Participants appeared to vary greatly in the levels of distress and insight they reported. This suggested that the study's results were based on a range of clinical presentations.

It was interesting that of the four types of trauma that participants referred to, only one (sexual abuse) that was measured by the study. The other three participants referred to witnessing domestic violence in childhood, bullying by peers in childhood and military service as an adult.

Acceptance related coping was referred to by a number of participants. Some comments alluded to a link between acceptance related coping and wellbeing. Some comments appeared to suggest that adjustment to voices and acceptance of them was facilitated by the passing of time.

Participants commented on difficult close relationships but also difficult relationships with society on a wider level. It was interesting that simplification and stigmatisation of difficulties by professionals and academia were specifically mentioned. Conflict was expressed between the acceptance of voices and fear of being stigmatised.

This final issue was suggested by the study as a possible barrier to the use of interpersonal coping and access to normalising explanations. Examples of quotes illustrating this barrier are provided overleaf.

Please note: Comments within square brackets have been changed for confidentiality purposes. Otherwise, the content has not been changed.

“When will research start trying to understand this phenomenon rather than treating it as an illness or consider it a mental problem?”

“Yes, I wish there was less stigma associated with hearing voices. I have heard voices since I was a child and I have a 4yr [] degree despite this. I do not tell people I hear voices especially work colleagues because its none of their business and because there is such a huge stigma attached. I wish there was less stigma so I could just be "Me", however, I have too much to lose by being open - my job and my professional reputation for one.”

“Diagnosed with [something] as a child. Began hearing voices at 21-22. Not seeking a "label" of 'psychosis' to avoid further discrimination and out casting. Trying to balance it out on my own.”

“I am scared she is going to make everyone think im some freak. I try to ignore her but it is hard. Please don't think I am stupid for not telling my parents. It is funny my [parent][works in mental health] but i dont think they will understand.”

“Thank you for the interest in schizophrenics. I hope the responses would be established (if they are mostly positive,,,) and erase the stigma in this world...Love and Peace”

Appendix I

University of Edinburgh, School of Health in Social Science RESEARCH ETHICS COMMITTEE

Self-Audit Checklist for Level 1 Ethical Review

The audit is to be conducted by

- **For funded research:** *The Principal Investigator ,*
- **Postdoctoral research fellowships** – *the applicant in collaboration with the proposed mentor.*
- **Postgraduate research** (PhD and Masters by Research) – *the students in collaboration with supervisor.*
- **Taught Masters dissertation work and Undergraduate dissertation/project work:** *the applicant in collaboration with dissertation/project supervisor*

Note: all members of staff and students should conduct ethical self-audit of their proposed research as part of the proposal process.

1. IRAS or LOCAL AUTHORITY/SOCIAL WORK ethical review

Does the project require IRAS review or review by bodies abroad?

NO

2. Protection of research subject confidentiality

Are there any issues of CONFIDENTIALITY which are not ADEQUATELY HANDLED by normal tenets of academic confidentiality?

NO

These include well-established sets of undertakings that may be agreed more or less explicitly with collaborating individuals/organisations, for example, regarding:

- (a) Non-attribution of individual responses;
- (b) Individuals and organisations anonymised in publications and presentation;
- (c) Specific agreement with respondents regarding feedback to collaborators and publication.

3. Data protection and consent

Are there any issues of DATA HANDLING and CONSENT which are not ADEQUATELY DEALT WITH and compliant with established procedures?

NO

These include well-established sets of undertakings, for example regarding:

- (a) Compliance with the University of Edinburgh's Data Protection procedures (see www.recordsmanagement.ed.ac.uk);
- (b) Respondents giving consent regarding the collection of personal data;
- (c) No special issues arising about confidentiality/informed consent.

4. Moral issues and Researcher/Institutional Conflicts of Interest

Are there any SPECIAL MORAL ISSUES/CONFLICTS OF INTEREST?

NO

- (a) An example of conflict of interest would be a financial or non-financial benefit for him/herself or for a relative or friend.

(b) Particular moral issues or concerns could arise, for example where the purposes of research are concealed, where respondents are unable to provide informed consent, or where research findings would impinge negatively/differentially upon the interests of participants.

5. Potential physical or psychological harm, discomfort or stress

(a) Is there a SIGNIFICANT FORSEEABLE POTENTIAL FOR PSYCHOLOGICAL HARM OR STRESS for participants?

YES Participants will be asked to indicate whether they experienced any interpersonal trauma during childhood. This may be upsetting.

(b) Is there a SIGNIFICANT FORSEEABLE POTENTIAL FOR PHYSICAL HARM OR DISCOMFORT?

(c) Is there a SIGNIFICANT FORSEEABLE RISK TO THE RESEARCHER?

NO
NO

6. Bringing the University into disrepute

Is there any aspect of the proposed research which might bring the University into disrepute? **NO**

7. Vulnerable participants

Are any of the participants or interviewees in the research vulnerable, e.g. children and young people, people who are in custody or care, such as students at school, self help groups, residents of nursing home? **YES**

8. Duty to disseminate research findings

Will all participants and relevant stakeholders have access to a clear, understandable and accurate summary of the research findings?

YES

Overall assessment

If all the answers are NO, the self audit has been conducted and confirms the ABSENCE OF REASONABLY FORESEEABLE ETHICAL RISKS. The following text should be emailed to the relevant person, as set out below:

Text: “I confirm that I have carried out the School Ethics self-audit in relation to [my / name of researcher] proposed research project [name of project and funding body] and that no reasonably foreseeable ethical risks have been identified.”

- **Research grants**– the Principal Investigator should send this email to the SHSS Research Ethics Administrator (L.Sheal@ed.ac.uk) it will be kept on file with the application.
- **Postdoctoral research fellowships** – the Mentor should ensure that the Fellow email the SHSS Research Ethics Administrator Office (L.Sheal@ed.ac.uk) where it will be kept on file with the application.

- Postgraduate research (**PhD and Masters by Research**) – **there is no need to send the Level 1 email. The ethical statement should be included in the student's Review reports.**
- Taught Masters dissertation **work and** Undergraduate dissertation/project **work** – **there is no need to send the level 1 email. The dissertation/project supervisor should retain the ethical statement with the student's dissertation/project papers.**

If one or more answers are YES, risks have been identified and level 2 audit is required. See the School Research Ethics Policy and Procedures webpage at <http://www.ed.ac.uk/schools-departments/health/research> for full details.

**University of Edinburgh
School of Health in Social Science
RESEARCH AND RESEARCH ETHICS
COMMITTEE**



Ethical review form for level 2 and level 3 auditing

This form should be used for any research projects carried out under the auspices of SHSS that have been identified by self-audit as requiring detailed assessment - i.e. level 2 and level 3 projects under the three-tier system of ethical approval that has been developed by the Research Ethics Committee of the School. The levels within the system are explained in the SHSS Research Ethics Policy and Procedures document. Please indicate which level applies to your research.

This form provides general School-wide provisions. Proposers should feel free to supplement these with detailed provisions that may be stipulated by research collaborators (e.g. NHS) or professional bodies (e.g. BSA, SRA). The signed and completed form should be submitted, along with a copy of the research proposal, research instruments and information and consent sheets to the relevant person (Subject Area Research Ethics Co-ordinator for staff, postdoctoral fellows and postgraduate students, Dissertation supervisor for undergraduate student projects;). Level 3 requests should also be lodged, (if possible electronically) with the School Research Ethics Administrator for forwarding to the Research Ethics Committee.

Research Ethics Committee will monitor level 2 proposals yearly to satisfy themselves that the School Ethics Policy and Procedures are being complied with. They will revert to proposers in cases where there may be particular concerns or queries. For level 2 and 3 audits, work should not proceed until issues raised have been considered, by the appropriate people. Level 3 applications should be submitted well in advance of a required date of approval (see submission dates on shared area address).

The form developed by the College of Humanities and Social Science will be used for level 2 and 3 reviews. If the answer to any of the questions below is 'yes', please give details of how this issue is being/will be addressed to ensure that ethical standards are maintained.

1 THE RESEARCHERS	
Your name and position	Emma Lidstone Trainee Clinical Psychologist
Proposed title of research	Factors that predict ways of coping with

	auditory hallucinations and the impact on well being.
Funding body	N/A
Time scale for research	1/8/2012
List those who will be involved in conducting the research, including names and positions (e.g. 'PhD student')	Dr Matthias Schwannauer Academic Supervisor Dr Donna Paxton Clinical Supervisor
2 RISKS TO, AND SAFETY OF, RESEARCHERS	
Those named above need appropriate training to enable them to conduct the proposed research safely and in accordance with the ethical principles set out by the College	No
Researchers are likely to be sent or go to any areas where their safety may be compromised, or they may need support to deal with difficult issues.	No
Could researchers have any conflicts of interest?	No
3 RISKS TO, AND SAFETY OF, PARTICIPANTS	
Could the research induce any psychological stress or discomfort?	Participants will be asked to indicate whether they experienced any interpersonal trauma during childhood. This may be upsetting.
Does the research involve any physically invasive or potentially physically harmful procedures?	No
Could this research adversely affect participants in any other way?	No
4 DATA PROTECTION	
Will any part of the research involve audio, film or video recording of individuals?	No
Will the research require collection of personal information from any persons without their direct consent?	No
How will the confidentiality of data, including the identity of participants (whether specifically recruited for the research or not) be ensured?	Consent forms will be collected separately from completed questionnaires. Questionnaires will not ask participants for any identifying information.
Who will be entitled to have access to the raw data?	The researcher and her supervisors.
How and where will the data be stored, in what format, and for how long?	Completed questionnaires will be locked in a filing cabinet at the Andrew Lang Unit. Electronic data will be kept on an encrypted pen drive. Data will be kept for the length of time advised by

	the University of Edinburgh.
What steps have been taken to ensure that only entitled persons will have access to the data?	Data will be locked in a filing cabinet on NHS property and kept on an NHS encrypted pen drive.
How will the data be disposed of?	Shredded and electronically deleted.
How will the results of the research be used?	The results will be disseminated to third sector support services. They will also hopefully be published. It is hoped that they will inform current understanding of why people adopt certain coping strategies and the impact of these on an individual's wellbeing in the context of experiencing auditory hallucinations.
What feedback of findings will be given to participants?	A summary of the results will be sent to all participating services. Participants will be given the opportunity to provide an email address if they wish to receive the summary directly.
Is any information likely to be passed on to external companies or organisations in the course of the research?	No
Will the project involve the transfer of personal data to countries outside the European Economic Area?	No
5 RESEARCH DESIGN	
The research involves living human subjects specifically recruited for this research project <i>If 'no', go to section 6</i>	Yes
How many participants will be involved in the study?	Minimum of 90
What criteria will be used in deciding on inclusion/exclusion of participants?	<u>Inclusion:</u> Participants over 18 Participants who have heard sounds or voices within the last month <u>Exclusion:</u> Participants under 18 Participants who have not heard any sound within the past month
How will the sample be recruited?	All UK branches of the Hearing Voices Network, Scottish Recovery Network and Support in Mind will be contacted for permission to approach users of their services. This will provide the study with a sample of users that access combinations of peer support,

	<p>individual support and drop in services.</p> <p>The researcher will meet with representatives of these services to explain the research project. The researcher will provide paper copies of the questionnaire pack so that the service representative can make them available to their service users. Alternatively, the researcher will attend the service/support group to explain the project and offer participation to service users directly.</p> <p>The questionnaire pack will also be made available online.</p>
Will the study involve groups or individuals who are in custody or care, such as students at school, self help groups, residents of nursing home?	No
Will there be a control group?	No
What information will be provided to participants prior to their consent? (e.g. information leaflet, briefing session)	Information about the study will be provided on the consent form.
Participants have a right to withdraw from the study at any time. Please tick to confirm that participants will be advised of their rights, including the right to continue receiving services if they withdraw from the study..	
Will it be necessary for participants to take part in the study without their knowledge and consent? (e.g. covert observation of people in non-public places)	No
Where consent is obtained, what steps will be taken to ensure that a written record is maintained?	A written consent form will be completed by every participant.
In the case of participants whose first language is not English, what arrangements are being made to ensure informed consent?	Participants who cannot read and write in English will not be able to participate.
Will participants receive any financial or other benefit from their participation?	No
Are any of the participants likely to be particularly vulnerable, such as elderly or disabled people, adults with incapacity, your own students, members of ethnic minorities, or in a professional or client relationship with the researcher?	No
Will any of the participants be under 16	No

years of age?	
Do the researchers named above need to be cleared through the Disclosure/Enhanced Disclosure procedures?	No
Will any of the participants be interviewed in situations which will compromise their ability to give informed consent, such as in prison, residential care, or the care of the local authority?	No
6 EXTERNAL PROFESSIONAL BODIES	
Is the research proposal subject to scrutiny by any external body concerned with ethical approval?	Yes
If so, which body?	Hearing Voices Network, Scottish Recovery Network and Support in Mind
Date approval sought	25.01.12
Outcome, if known <i>or</i>	
Date outcome expected	
7 ISSUES ARISING FROM THE PROPOSAL	
<p>In my view, ethical issues have been satisfactorily addressed, OR In my view, the ethical issues listed below arise and the following steps are being taken to address them:</p> <p>Each service/group that is visited will have an identified member of staff/group leader that is available to talk to participants about any difficult feelings that arise from completing the questionnaires. This person will be identified on the consent form so that participants are made aware of this arrangement before completing any questionnaires.</p> <p>Signature Emma Lidstone Date 25.01.12</p>	
<p>Thank you for submitting your application. It has now been reviewed by both myself and an independent reviewer. Some potential issues have been raised and we would value further clarification of these risks and how they might be addressed in the box below.</p> <ul style="list-style-type: none"> • Could there be any responses which would indicate risk to the individual or others? How would the project handle any such situations? • Personal and research data should be stored separately with separate procedures indicated for dealing with these two distinct types of data. • Is being able to contact a member of the group / network that they are recruited through sufficient to address any difficulties / upset that may arise from the questionnaires? <p>Signature Dr S O'Rourke Date 21.03.12</p>	
<p>• Could there be any responses which would indicate risk to the individual or others? How would the project handle any such situations? No. None of the items indicate risk.</p>	

The closest indicator for risk would be the responses that indicate what participants think it means to hear voices, like, 'I would harm someone' and 'They mean I will harm myself' but these are hypothetically worded and ask about meaning, they don't measure whether/how much the person actually thinks these things or whether they have any concerns/intentions regarding them.

- Personal and research data should be stored separately with separate procedures indicated for dealing with these two distinct types of data.

Yes, consent forms will be completed and stored separately from the questionnaire packs.

- Is being able to contact a member of the group / network that they are recruited through sufficient to address any difficulties / upset that may arise from the questionnaires?

Everyone who completes the questionnaire will already be receiving support through the Hearing Voices Network or the Scottish Recovery Network. This means that participants will either be attending groups or will be having one to one contact with a member of staff from the Scottish Recovery Network. In my mind encouraging people to utilise this contact for support would be the best option. On thinking about this though, I propose that I also provide helpline numbers like the National Hearing Voices Helpline, Mind's info line, Breathing Space and Samaritans on the back of the questionnaire.

Amendments:

The item, 'Did an adult or person at least 5 years older than you ever Touch or fondle you or have you touch their body in a sexual way?

or

Try to or actually have oral, anal, or vaginal sex with you?'

Will be changed to

'Did an adult or person at least 5 years older than you ever have contact with you in a sexual way?'

The provision of helpline numbers at the end of the questionnaire pack.

The consent form on Survey Monkey will not identify a specific staff member but instead will read 'If you feel upset, please look after yourself. The staff from the service that told you about this study are happy to talk about any feelings that the questionnaires might bring up for you.'

Asking for name and signature will be replaced with a dated tick box to maintain participant anonymity.

Signature **Emma Lidstone**

Date **23.3.12**

I am pleased to confirm that your revised proposal has been reviewed by and independent reviewer and myself and we can confirm that no further ethical review is required.

Signature **Dr S O'Rourke**

Date **17.04.12**

Appendix II: References (full list)

Systematic Review

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